

## Cover Page

### Project Title: PM<sub>2.5</sub> Emissions Reduction Projects: Paving Lots & Alleyways

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#### Applicant Information:

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Imperial County Air Pollution Control District

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DUNS Number: 799438106

#### Budget Summary:

EPA Funding Requested	Voluntary Cost Share	Total Project Cost
\$16,151,788.00	\$190,905	\$16,342,693

**Project Period:** Estimated Project Start Date is July 1, 2020, and estimated Project End Date is January 1, 2025.

**Project Description:** Pave 5 unpaved school parking lots; pave 1 Imperial County Center unpaved parking lot; pave approximately 11.25 miles of unpaved alleyways in El Centro, CA; pave approximately 3.46 miles of unpaved alleyways in Calexico, CA.

**Project Location:** Imperial County, CA – PM<sub>2.5</sub> Non-Attainment Area (2012 annual standard of 12 micrograms per cubic meter)

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## Section 1. Project Summary and Approach

Imperial County extends over 4,284 square miles<sup>1</sup> in the southeastern portion of California, bordering Mexico to the south, Riverside County to the north, San Diego County to the west, and the State of Arizona to the east. The Imperial Valley runs approximately north-to-south through the center of the County and extends into Mexico. The terrain elevation varies from as low as 230 feet below sea level at the Salton Sea to the north, to more than 2,800 feet above sea level at the mountain summits to the east. The Imperial County is a nonattainment area for the 2006 24-hr PM<sub>2.5</sub> standard. Imperial County received a partial nonattainment designation for the 2006 PM<sub>2.5</sub> standard which includes the majority of the populated area in the county. Specifically, the PM<sub>2.5</sub> nonattainment area includes the portion of Imperial County that lies within the area described as follows: (San Bernardino Baseline and Meridian) beginning at the intersection of the United States-Mexico Border and the southeast corner of T17S R11E, then north along the range line of the eastern edge of range R11E, then east along the township line of the southern edge of T12S to the northeast corner of T13S R15E, then south along the range line common to R15E and R16E, to the United States-Mexico Border.

On December 14, 2012, USEPA issued a final rule revising the PM<sub>2.5</sub> NAAQS by lowering the primary annual PM<sub>2.5</sub> standard from 15 µg/m<sup>3</sup> to 12 µg/m<sup>3</sup> to provide increased protection against health effects associated with long- and short-term fine particle exposures. The USEPA retained the primary 24-hour PM<sub>2.5</sub> standard of 35 µg/m<sup>3</sup> and the existing secondary (welfare-based) annual PM<sub>2.5</sub> standard of 15 µg/m<sup>3</sup>. In April 2015, Imperial County was classified as a Moderate PM<sub>2.5</sub> nonattainment area for the annual PM<sub>2.5</sub> primary standard of 12 µg/m<sup>3</sup>. The PM<sub>2.5</sub> nonattainment area for the 2012 Annual PM<sub>2.5</sub> NAAQS includes the same area covered under the 2006 24-hour PM<sub>2.5</sub> Moderate nonattainment area, which is presented in Figure 1-1 on the following page.

One of Imperial County's unique features is also its greatest challenge when trying to improve air quality, as it is one of California's international gateways. In particular, the City of Calexico shares a border with the densely populated city of Mexicali, Mexico. The primary reason for elevated PM<sub>2.5</sub> levels in the County is emissions transport from Mexico. Under the Moderate PM<sub>2.5</sub> nonattainment area classification, Imperial County was required to produce an Annual PM<sub>2.5</sub> SIP by October 2016 (18 months from the date of designation). In April 2018, Imperial County submitted the Imperial County 2018 Annual PM<sub>2.5</sub> State Implementation Plan (SIP) to demonstrate attainment of the 2012 Annual PM<sub>2.5</sub> NAAQS “but for” transport of international emissions from Mexico. In accordance with Section 179(B) of the CAA, the 2018 Annual PM<sub>2.5</sub> SIP satisfies the attainment demonstration requirement and other provisions of Subpart 1 and Subpart 4 of Part D of the CAA.

The Imperial County Air Pollution Control District (ICAPCD or “District”) shares responsibility with the California Air Resources Board (CARB) for ensuring that all state and federal ambient air quality standards are achieved and maintained within the County. The ICAPCD is responsible for monitoring ambient air quality and has authority to regulate stationary sources and some area sources of emissions. The ICAPCD is responsible for developing the overall attainment strategy for Imperial County, and therefore, is responsible for planning activities involving the development of emission inventories, quantification of emission reductions, and comparison of emission reduction strategies. As of July 1, 2016, Imperial County's population is approximately 180,883 people<sup>2</sup> and its principal industries are farming and retail trade. Most of the population, farming, and retail trade exist in a band of land that, on average, comprises less than one-fourth the width of the County, stretching from the south shore of the Salton Sea to the United States-Mexico border. The road network is densest within this strip, as shown in Figure 1-1 on the following page. It also connects the three most populated cities in the county, which are Brawley, El Centro, and Calexico. Their populations are about 26,500, 45,000, and 38,500, respectively. The rest of Imperial County is the Salton Sea and mostly dry, barren desert area with little to no human population.

The non-attainment area contains a handful of emissions source categories that significantly contribute to the PM<sub>2.5</sub> nonattainment status, such as vehicular traffic, unpaved road dust, fugitive windblown dust, farming operations, managed burning and disposal, and aircraft. Based on the emissions inventory data included in the 2018 Annual PM<sub>2.5</sub> SIP, unpaved road dust emissions, classified as an area wide emissions source, account for 36% of the PM<sub>2.5</sub> emissions in Imperial County. For fugitive windblown dust, which is also an area wide emissions source, these emissions based on the 2018 Annual PM<sub>2.5</sub> SIP account for 32% of the PM<sub>2.5</sub> emissions in the County. Given these figures, it is apparent that unpaved road and fugitive

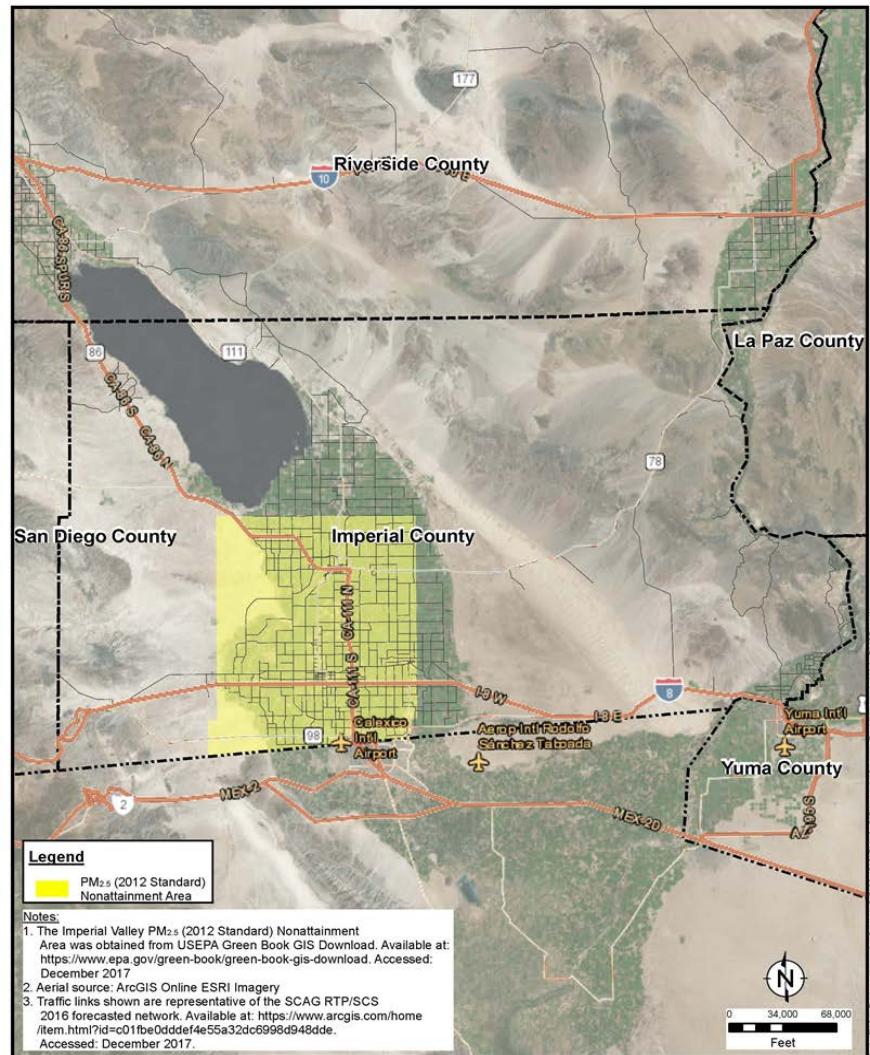
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<sup>1</sup> Official website of Imperial County, <http://www.co.imperial.ca.us/>.

<sup>2</sup> U.S. Census Bureau Quick Facts 2016, <https://www.census.gov/quickfacts/fact/table/imperialcountycalifornia>

dust emissions are both major contributors to the nonattainment status of Imperial County; however, mitigation of these emissions can be achieved via the implementation of paving projects at school and community parking lots and alleyways in the City of Calexico.

**Figure 1-1: Boundaries and Road Network of PM<sub>2.5</sub> Nonattainment Area**



Based on Imperial County’s attainment conditions, and the air quality and emissions sources of the area, the ICAPCD is proposing to obtain funds for four components to reduce PM<sub>2.5</sub> emissions by paving various unpaved school parking lots, one county multi-use unpaved parking lot, unpaved alleyways in the City of Calexico, and unpaved alleyways in the City of El Centro. All of the projects in these four components would take place within the County’s designated Moderate PM<sub>2.5</sub> nonattainment area, which adversely affects residents, workers, and other sensitive receptors within Imperial County. Implementing this four-component approach will make a significant difference and assist with improving the PM<sub>2.5</sub> attainment status of Imperial County. The school/county parking lot paving projects and the City of Calexico and El Centro Alleyway paving projects will have a direct PM<sub>10</sub> and PM<sub>2.5</sub> emissions reduction on the Imperial County Unpaved Road Travel Dust – City and County Roads Category (EIC: 645-638-5400-0000) and Windblown Dust – Unpaved Roads Category (EIC: 650-652-5400-0000). The projects will have a slight increase in the Paved Entrained Road Travel Dust – Local Streets Category (EIC: 640-641-5400-0000). For further analysis on the calculations and methodologies of the emissions reductions to the County’s emissions inventories, please see Attachment A, Emissions Inventories.

The Air District's proposal includes the following four (4) components that address two significant emission categories causing air quality issues in the Imperial County Non-Attainment areas for PM<sub>2.5</sub>: dust emissions from unpaved parking lots and dust emissions from unpaved alleyways. These various proposed projects will directly reduce PM<sub>2.5</sub> emissions, which would otherwise continue to contribute to the PM<sub>2.5</sub> emissions inventory and nonattainment status of the County. The components (projects) of this application are as follows:

- Component 1 – Reducing Dust Emissions from Unpaved School Lots
- Component 2 – Reducing Dust Emissions from Unpaved County Lot
- Component 3 – Reducing Dust Emissions from Unpaved Alleyways (El Centro, CA)
- Component 4 – Reducing Dust Emissions from Unpaved Alleyways (Calexico, CA)

Paving these school and county parking lots within the communities in Imperial County, as well as the alleyways in El Centro and Calexico, will result in the greatest amount of emission reductions possible, greater than what would be achieved through either the application of chemical soil stabilizers or the gravel on the roadway. Paving projects in Imperial County have historically demonstrated that this approach produces real and quantifiable results for reducing particulate emissions to the maximum extent possible for unpaved surfaces, such as roadways or parking lots.

## **Component 1 – Reducing Dust Emissions from Unpaved School Lots**

### ***i. Detailed Project Summary***

Dust emissions are a significant source of directly emitted PM<sub>2.5</sub> on the non-attainment area, and a portion of these emissions come from unpaved school parking lots within communities of Imperial County (see Figure 1-2 as an example). These emissions sources impact surrounding residents as vehicles and wind disturb the top soil, breaking up the ground and producing airborne dust, thereby generating particulate matter emissions (PM<sub>2.5</sub> and PM<sub>10</sub>) which cause serious respiratory diseases amongst the populace. The ICAPCD has identified various unpaved parking lots within school districts throughout Imperial County's PM<sub>2.5</sub> nonattainment area. These unpaved lots are located at elementary schools, middle schools, and high schools in communities including, but not limited to, El Centro, Holtville, Heber, and Calexico. Based on the research done by ICAPCD Staff, the five (5) potential parking lots will range in total area from 10,000 sq. ft. to 35,000 sq. ft. The school parking lots see a great amount of vehicle activity on school days, and for some locations, in summer and on weekends by members of the community. On school days, a significant number of family members drive to each parking lot to drop off their children (students) in the morning, and return to the lot in the afternoon to pick them up. Additionally, school staff/faculty utilize the unpaved parking lot sites throughout the day.

Overall, the health risk for residents, and vulnerable segments of the population such as students (children) and those with respiratory illnesses, can be lessened from mitigating the particulate matter emissions from the unpaved parking lots because of vehicle traffic and wind erosion. Paving these areas will considerably reduce PM<sub>10</sub> and PM<sub>2.5</sub> emissions from these sources, lessen the health impact to the surrounding population, and improve the infrastructure and quality of life within our communities. The following section includes a description of the work products needed for fully implementing Component 1:

### ***ii. Description of Work Products***

- A. Evaluating Projects and Funding Agreements:** ICAPCD will work with clients and contractors to provide the funds needed for purchasing the products and services needed to pave each unpaved parking lot and reduce particulate matter emissions. Funding Agreements will be drafted and finalized by the ICAPCD with the administration of each schools district to ensure that all needed equipment and services will be utilized in accordance with the purpose of the grant.
- B. Program Implementation/Outreach:** ICAPCD will work with clients under contract to manage and carry out the paving of each of these unpaved (dirt) parking lots. The ICAPCD will also develop outreach material and presentations to educate the public on the agency's efforts to reduce particulate matter emissions from unpaved areas in the County.
- C. Program Evaluation:** ICAPCD will evaluate the final emissions reductions which result from each paving project and monitor the condition through on-site inspections of the final paved projects for 5 years post-construction.

**Figure 1-2: Example of a School Unpaved Parking Lot (Calexico Unified School District)**



### ***iii. Emissions Source Categories Addressed***

Component 1 addresses directly emitted PM<sub>10</sub> and PM<sub>2.5</sub> emissions due to disturbances of the surface of unpaved school parking lots in Imperial County. The following is a summary of the emissions reduction calculations from paving 5 unpaved school parking lots. For a detailed analysis of the emissions reduction calculations for Component 1, please see Attachment B, Emissions Reduction Calculations:

#### ***Component 1 Total Emissions Reductions (5 School Parking Lots)***

<b>Category</b>	<b>PM 10 (tons/yr)</b>	<b>PM2.5 (tons/yr)</b>
<b>Emissions Reduction Per Project</b>	2.37	0.25
<b>Total Emission Reductions (5 Paving Projects)</b>	<b>11.85</b>	<b>1.25</b>

### ***iv. Roles of the Applicant and Partners***

To implement the paving projects under Component 1, ICAPCD will serve as the lead agency in fulfilling the following: 1) evaluate the project applications; 2) draft funding agreements with school districts (clients); 3) inspect the conditions of each unpaved school parking lot project, before and after construct (paving) is completed; 4) coordinate efforts between the applicants and contractors; 5) provide final payment to clients once all project requirements are fulfilled by the clients.

## **Component 2 — Reducing Dust Emissions form Unpaved County Lot**

### ***i. Detailed Project Summary***

Component 2 of this ICAPCD application is very similar to Component 1, but for this proposal, the focus is on reducing PM<sub>2.5</sub> emissions by paving one (1) heavily used County/Public unpaved parking lot at a county center located in El Centro, CA. The site under this proposal is one of the parking lots located within County Center II, which is located at 328 Applestill Road, in the southern section of the City of El Centro. County Center II consists of various buildings and offices of Imperial County agencies, including the Sheriff's Office and County Jail, Animal Control, and the Betty Jo McNeece Shelter Home for children. Imperial County Sheriff's Office (ICSO) Staff primarily utilize the unpaved parking lot in this proposal every day, as well as members of the public. The unpaved parking lot in question, which under this proposal will be paved, is 46,000 sq. ft. (1.06 acres) in size. According to ICSO, over three hundred (300) citizens arrive each day to their office and the County Jail for a variety of matter, including inmate visitation, attorney visits, and other facility and inmate events. ICSO's Training Center conducts regular events such as advanced officer training, recruitment testing, meetings and other



events, which contributes approximately 6,000 vehicles per year to County Center II. Given this, ICSO conservatively estimates that a total of 40,172 vehicles per year park at this unpaved parking lot.

The current condition of the unpaved parking lot at County Center II is depicted in Figure 1-3 below. Paving this lot will reduce the amount of PM<sub>2.5</sub> and PM<sub>10</sub> emissions in the City of El Centro and the emissions inventory of Imperial County, while reducing the emissions exposure and health risk to the public and workers who visit County Center II and residents living in the surrounding vicinity. The following section provides a description of the work products for fully implementing the paving project in El Centro, CA:

**Figure 1-3: County Center II-ICSO Unpaved Parking Lot**



## **ii. Description of Work Products**

- A. Evaluating Projects and Funding Agreements:** ICAPCD will work with ICSO and Imperial County Public Works Department (ICPWD), who will carry out the paving construction project of the unpaved lot at Counter Center II. The ICAPCD will ensure that awarded funds are directed to purchase required products and services for paving the unpaved lot. Funding Agreement(s) will be finalized by the ICAPCD with ICPWD to ensure that all equipment and service will be used in accordance with the purpose of the grant.
- B. Program Implementation/Outreach:** ICAPCD will work with ICPWD, who will be under contract with the ICAPCD, to manage and carry out the paving of the unpaved parking lot at County Center II. The ICAPCD will also develop outreach material and presentations to educate the public on the agency's efforts to reduce particulate matter emissions from unpaved sources such as this parking lot in Imperial County.
- C. Program Evaluation:** ICAPCD will evaluate the final emissions reductions that result from this parking lot paving project and monitor the condition through on-site inspections of the final paved project for 5 years post-construction.

## **iii. Emissions Source Categories Addressed**

Component 2 addresses directly emitted PM<sub>10</sub> and PM<sub>2.5</sub> emissions from dust generated due to disturbances of the surface of the County Center II unpaved parking lot. The following is a summary of the emissions reduction calculations for this parking lot paving project. For a detailed analysis of the emissions reduction calculations for Component 2, please refer to Attachment B, Emissions Reduction Calculations:

**Component 2 Total Emissions Reductions (County Center II Lot)**

Unpaved Parking Lot Emissions	PM 10 (tons/yr)	PM2.5 (tons/yr)
<b>Total Emission Reductions</b>	<b>3.92</b>	<b>0.41</b>

#### iv. Roles of the Applicant and Partners

To carry out the project under Component 2, the ICAPCD will serve as the lead agency in fulfilling the following: 1) evaluate the final project application submitted by ICSO and ICPWD; 2) draft funding agreement(s) with ICPWD; 3) inspect the conditions of the County Center II unpaved parking, before and after construction is completed; 4) coordinate efforts between ICSO, ICPWD, and any potential sub-contractors; 5) provide final payment to client(s) once all project requirements are fulfilled per the Funding Agreement.

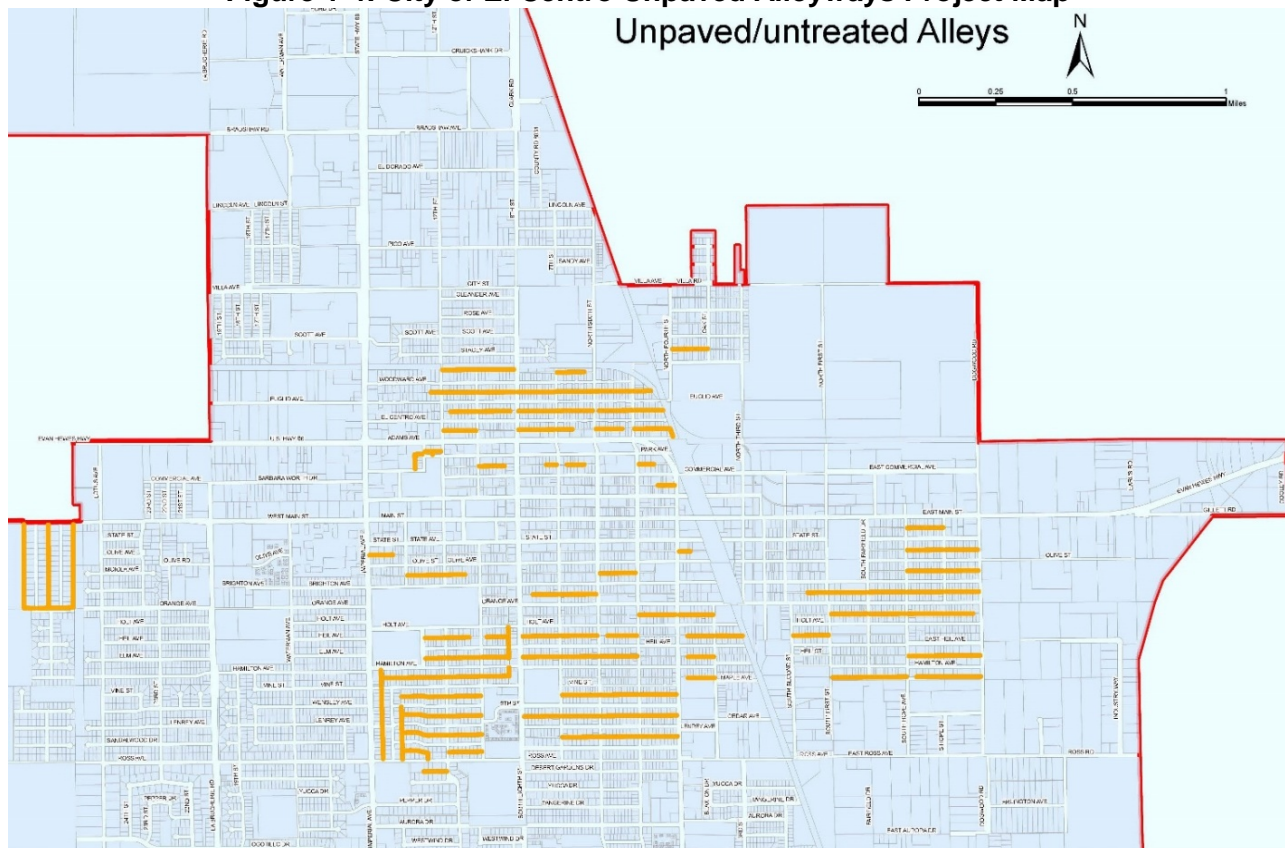
### Component 3 — Reducing Dust Emissions from Unpaved Alleyways (El Centro, CA)

#### i. Detailed Project Summary

Component 3 of ICAPCD's application is the first of two components that proposes the paving of unpaved alleyways in one of the major cities within the Imperial County PM<sub>2.5</sub> non-attainment area. The proposed project of Component 3 is the paving of various unpaved alleyways throughout the City of El Centro, which is the most populated city in Imperial County and the PM<sub>2.5</sub> non-attainment area of the County. The City of El Centro identified a network of unpaved alleyways, consisting of 107 alley segments, which are located primarily within residential neighborhoods in the City. The total length of the 107 native soil alley segments is approximately 11.25 miles (59,420 linear feet), with the standard width being 20 feet. In this proposal, all of the unpaved alleyways would be improved with asphaltic concrete (AC) roadway surfacing. The identified alleyways in the City often serve as the primary access routes for residents' homes, secondary dwellings, and/or apartment parking. While the majority of commercial zone alleyways have been improved, many unpaved alleys still exist in the heart of the City, which is the older residential section of town. These alleyways are also adjacent to public schools, including but not limited to: Central Union High School, Wilson Junior High School, Lincoln Elementary School, Harding Elementary School, and Washington Elementary School.

Figure 1-4 below displays the unpaved alleys, all located within the City of El Centro, which will be improved with AC roadway surfacing per the proposal. The next section contains a description of the work products for fully implementing the alleyways paving project of 11.25 miles of unpaved alleyways in the City of El Centro:

**Figure 1-4: City of El Centro Unpaved Alleyways Project Map**  
Unpaved/untreated Alleys



Paving these regularly travelled native soil alleyways in the City of El Centro will assist in reducing the health risk to residents that live in close proximity to the alleyways and students and faculty of nearby schools. The project will also aid in reducing PM<sub>2.5</sub> and PM<sub>10</sub> emissions in Imperial County, thus directly advancing the County’s efforts in improving Imperial County’s PM<sub>2.5</sub> non-attainment status and quality of life.

## ***ii. Description of Work Products***

- A. Evaluating Projects and Funding Agreements:** ICAPCD will work with the City of El Centro, who will administer the paving construction project of the network of unpaved alleys in the City, along with selected contractors and sub-contractors. The ICAPCD will ensure that awarded funds are directed to purchasing the required products and services for paving the unpaved alleyways. Funding Agreement(s) will be drafted and finalized by the ICAPCD with the City of El Centro to ensure that all equipment will be used in accordance with the purpose of the grant, and that all services employed will be exclusively for this alleyways paving project.
- B. Program Implementation/Outreach:** ICAPCD will collaborate with the City of El Centro, who will be under contract with the ICAPCD, to manage and carry out the paving of the native soil alleyways. The ICAPCD will also develop outreach material and presentations to educate the public on the agency’s efforts to reduce particulate matter emissions from unpaved sources in the City.
- C. Program Evaluation:** ICAPCD will evaluate the final emissions reductions that result from this alleyways paving project and monitor the condition through on-site inspections of the final paved project for 5 years post-construction.

## ***iii. Emissions Source Categories Addressed***

Component 3 addresses directly emitted PM<sub>10</sub> and PM<sub>2.5</sub> emissions from dust generated due to disturbances of the surface of the various unpaved alleyways within the City of El Centro. The following is a summary of the emissions reduction calculations for paving this network of unpaved alleyways. For a detailed analysis of the emissions reduction calculations for Component 3, please refer to Attachment B, Emissions Reduction Calculations:

### ***Component 3 Total Emissions Reductions (El Centro Alleyways)***

<b>Unpaved Alleyways</b>	<b>PM 10 (tons/yr)</b>	<b>PM2.5 (tons/yr)</b>
<b>Total Emissions Reductions</b>	<b>193.67</b>	<b>19.95</b>

## ***iv. Roles of the Applicant and Partners***

To carry out the project under Component 3 the ICAPCD will serve as the lead agency in fulfilling the following: 1) evaluate the final project proposal application from the City of El Centro; 2) draft funding agreement(s) with the City of El Centro; 3) inspect the physical conditions of each unpaved alleyway, before and after construction is completed; 4) coordinate efforts between the City of El Centro and any selected contractors; 5) provide final payment to client once all requirements are fulfilled per the Funding Agreement.

## **Component 4 — Reducing Dust Emissions from Unpaved Alleyways (Calexico, CA)**

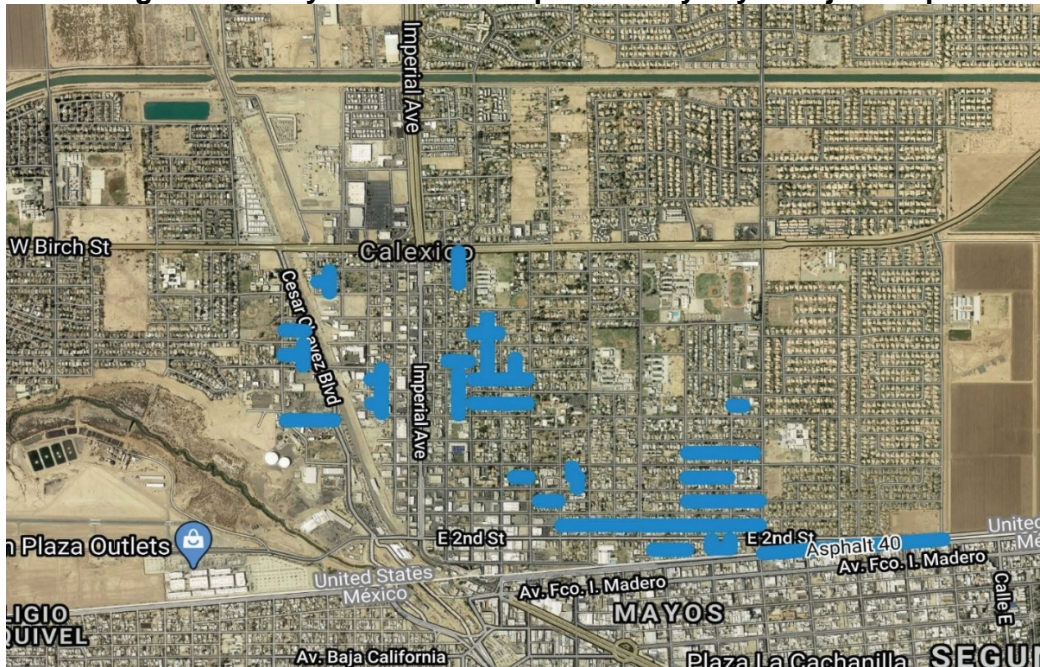
### ***i. Detailed Project Summary***

Component 4 of ICAPCD’s application consists of the proposed paving of approximately 3.46 miles of unpaved alleyways in the City of Calexico, which is located along the International Border between the United States and Mexico in Imperial County. First, the proposal consists of paving approximately 2.84 miles (15,000 linear feet) of unpaved alleyways in Calexico, in which residential, commercial, and law enforcement vehicles travel on a daily basis with Class 2 Base. These alleyways intersect various single and multi-family residences in the City of Calexico, and residents utilize the alleys daily to access their homes. Second, the proposal calls for the asphalt paving of two extreme-use alleyways within the City of Calexico, which total approximately 0.62 miles (3,288 linear feet). The first alleyway connects Cesar Chavez Blvd. and Pierce Ave., east of the City of Calexico’s Water Treatment Plant. The second alleyway is the unpaved road/alley of Anza Rd., which is directly east of East 1<sup>st</sup> St. and runs along the International Border between U.S. and Mexico. U.S. Border Patrol vehicles drive this alleyway extensively each day, as they have a continuous presence in the area for monitoring and securing the border.



Improving these alleyways identified by the City of Calexico would greatly reduce the amount of particulate matter emissions that would adversely affect residents and workers in the City of Calexico. Looking at the residents in more detail, sensitive groups in the population, such as students, individuals with respiratory issues, and the elderly, will benefit greatly from the resulting PM<sub>10</sub> and PM<sub>2.5</sub> emissions. Mitigating these particulate matter emissions would also contribute to the ICAPCD's efforts to improve the PM<sub>2.5</sub> non-attainment status of Imperial County. Figure 1-4 below gives a visual representation of the majority of unpaved alleys that are included in the City of Calexico's proposal for paving, totaling 3.23 miles, of which 2.61 miles will be paved with Class 2 Base and 0.62 miles will be paved with asphalt for the extreme-use alleyways. The additional 0.23 miles (1,215 linear feet) of unpaved alleyways, which will be paved with Class 2 Base, will be identified in the final submitted proposal from the City of Calexico to the ICAPCD.

**Figure 1-4: City of Calexico Unpaved Alleyways Project Map**



## ii. Description of Work Products

- A. Evaluating Projects and Funding Agreements:** ICAPCD will work with the City of Calexico, who will administer the paving construction project of the network of unpaved alleys in Calexico, along with selected contractors and sub-contractors. The ICAPCD will ensure that awarded funds are directed to purchasing the required products and services for paving the unpaved alleyways. Funding Agreement(s) will be drafted and finalized by the ICAPCD with the City of Calexico to ensure that all equipment will be used in accordance with the purpose of the grant, and that all services employed will be exclusively for this alleyways paving project.
- B. Program Implementation/Outreach:** ICAPCD will work with the City of Calexico, who will be under contract with the ICAPCD, to manage and carry out the paving of the unpaved alleyways in Calexico, CA. The ICAPCD will also develop outreach material and presentations to educate the public on the agency's efforts to reduce particulate matter emissions from unpaved sources such as these high-traveled alleyways in Calexico.
- C. Program Evaluation:** ICAPCD will evaluate the final emissions reductions that result from this alleyways paving project and monitor the condition through on-site inspections of the final paved project for 5 years post-construction.

## iii. Emissions Source Categories Addressed

Component 4 addresses directly emitted PM<sub>10</sub> and PM<sub>2.5</sub> emissions from dust generated due to disturbances of the surface of unpaved alleyways located in residential and commercial areas within the City of Calexico. The following is a summary of the emissions reduction calculations for paving this network of unpaved alleyways (Class 2 Base Alleys and the Asphalt Alleys). For a detailed analysis of the emissions reduction calculations for Component 4, please refer to Attachment B, Emissions Reduction Calculations:

**Component 4 Total Emissions Reductions (All Unpaved Calexico Alleyways)**

<b>Category</b>	<b>PM 10 (tons/yr)</b>	<b>PM2.5 (tons/yr)</b>
Class 2 Base Alleyways Reductions	56.37	5.79
Asphalt Alleyways Reductions	114.04	11.43
<b>Total Emission Reductions (All Alleyways)</b>	<b>170.41</b>	<b>17.22</b>

**iv. Roles of the Applicant and Partners**

To carry out the project under Component 4, the ICAPCD will serve as the lead agency in fulfilling the following: 1) evaluate the final project proposal application submitted by the City of Calexico; 2) draft funding agreement(s) with the City of Calexico; 3) inspect the physical conditions of each unpaved alleyway, before and after construction is completed; 4) coordinate efforts between the City of Calexico and any selected contractors; 5) provide final payment to client once all requirements are fulfilled per the Funding Agreement.

**Section 2. Community Benefits, Engagement, and Partnerships**

Component 1 targets directly emitted PM<sub>2.5</sub> and PM<sub>10</sub> emissions from unpaved parking lots at school sites within Imperial County. The project will benefit air quality emissions throughout the course of the year through the paving of unpaved parking lots at schools, which in turn will lower the health risk and emissions exposure to students and their family members, school faculty, and residents in the surrounding community. The ICAPCD has received various letters of support from school districts for obtaining funds to implement these parking lot paving projects at their respective school sites (see Attachment C, Letters of Support/Partnership).

Component 2 targets directly emitted PM<sub>2.5</sub> and PM<sub>10</sub> emissions from an unpaved parking lot at one of the primary county centers in the PM<sub>2.5</sub> non-attainment area of Imperial County. The project will benefit air quality emissions throughout the course of the year through paving the Counter Center II parking lot, which in turn will lower the health risk and emissions exposure to workers and the public. The ICAPCD has received letters of support from both ICSO and IPCWED to implement this parking lot paving project at County Center II (see Attachment C, Letters of Support/Partnership).

Component 3 targets directly emitted PM<sub>2.5</sub> and PM<sub>10</sub> emissions from the unpaved alleyways in the PM<sub>2.5</sub> non-attainment area of Imperial County, thereby assisting in improving the attainment for PM<sub>2.5</sub>. The project will reduce daily and annual particulate matter emissions via the paving of this network of alleyways, which in turn will lower the health risk and emissions exposure to the public (residents, students, workers) in the City of El Centro and the County. The City of El Centro has provided a letter of support to the ICAPCD for this vital and beneficial project for the community (see Attachment C, Letters of Support/Partnership).

Component 4 targets reducing directly emitted PM<sub>2.5</sub> and PM<sub>10</sub> emissions from unpaved alleyways located in the PM<sub>2.5</sub> non-attainment area of Imperial County, which in turn will lower the health risk and emissions exposure to the general public, workers, and law enforcement personnel (U.S. Border Patrol), particularly individuals who reside the majority of the time in the City of Calexico. In conjunction with this, the project will assist Imperial County with improving its attainment status for PM<sub>2.5</sub>. The City of Calexico has provided a letter of support to the ICAPCD for this vital and beneficial project for the community (see Attachment C, Letters of Support/Partnership).

The projects implemented by this grant would help address the economic and health struggles that the Imperial County community's face. Children are highly susceptible to the impacts of air pollutants, as their lungs and immune systems are in various stages of development. Over 6 million children in the US are living with asthma (ref CDC), making it the most commonly diagnosed chronic childhood disorder. As the prevalence of pediatric asthma continues to rise, trends suggest widening racial, ethnic and economic disparities. In this rural border region of southeastern CA, the region faces excess PM<sub>10</sub> levels, with concentrations reaching 10 times the federal limits. Hospitalization rates for asthma remain among the highest in the state, most notably for children. One in five children is diagnosed with asthma and the rate of asthma-related pediatric emergency room visits and hospitalizations is double the CA state average. This vulnerable rural community is >80% Latino, faces a 20% unemployment rate and more than 1 in 3 children live in poverty.

The proposed project in this application would greatly assist Imperial County with reducing air emissions and exposure to residents within our local AB 617 Community of El Centro-Heber-Calexico (Corridor), which was selected by CARB as a Year 1 Community of the Community Air Protection Program (CAPP). The primary focus of this Program is to reduce exposure to air pollution in disproportionately burdened communities throughout the State of California, through implementing statewide strategies and community-specific reduction programs. This AB 617 Community, made up of the three “affected communities” of El Centro, Heber, and Calexico, faces various environmental concerns which this emissions reduction project will directly address in a positive manner. The ICAPCD formed a partnership with local environmental justice organization, Comité Civico del Valle (CCV) to nominate our AB 617 Corridor. Once selected, ICAPCD and CCV worked together to establish the Community Steering Committee (CSC), which is made up of residents and workers of the Corridor, while the ICAPCD and CCV serve as Co-Chairs of the CSC. These projects would be implemented in conjunction with other local emissions reducing projects approved by the CSC and CARB in the Corridor’s Community Emissions Reduction Program, thereby reducing the health risk of residents and addressing the concerns of the public and local environmental justice groups.

### Section 3. Project Sustainability

#### Sustainability

The key to effective sustainable paving projects is proper installation and ongoing maintenance. Asphalt pavements are quiet, smooth, quick and easy to maintain, and 100% recyclable. Environmentally, economically, and socially, paving projects are the most sustainable project options. Routine inspection and maintenance programs should be established to ensure long-term durability and performance. Sustainable paving may not be appropriate for every site due to factors such as the use of the area, soil infiltration rates, slope, soil contamination, and cost. When used in appropriate areas in our communities, paving can effectively manage stormwater, offering environmental benefits and creating more sustainable and greener communities. In an effort to promote more sustainable decisions regarding pavement design and applicability as well as construction and management, the ICAPCD in collaboration with the Public Works, City of El Centro, City of Calexico and various Imperial County Schools District, will seek to optimize individual aspects of the paving areas in an effort to increase and achieve its sustainability.

### Section 4. Environmental Results – Outcomes, Outputs, and Performance Measures

#### *i. Outputs, Outcomes, Performance Measures*

Below is a summary of the outputs, outcomes, and performance measures for Components 1 through 4, which will all directly target and reduce PM<sub>10</sub> and PM<sub>2.5</sub> emissions through various paving projects in the PM<sub>2.5</sub> non-attainment area of Imperial County:

#### **Component 1 – Reducing Dust Emissions: Unpaved School Parking Lots**

Activity	Outputs	Outcomes	Performance Measures
Paving of 5 unpaved parking lots at public schools in the County.	Paving 5 unpaved parking lots at school sites throughout the PM <sub>2.5</sub> Non-Attainment Areas of Imperial County. These projects will reduce PM <sub>2.5</sub> and PM <sub>10</sub> emissions and the air emissions exposure to residents and sensitive receptors.	Annual Emission Reductions: <ul style="list-style-type: none"> <li>• <b>1.25 tons of PM<sub>2.5</sub></b></li> <li>• <b>11.85 tons of PM<sub>10</sub></b></li> </ul>	Pre- and post- Inspection of each unpaved school parking lot (before and after paving); review quarterly performance and conditions reports from clients.

**Component 2 – Reducing Dust Emissions: Unpaved County Lot**

Activity	Outputs	Outcomes	Performance Measures
Paving unpaved parking lot at County Center II	Paving the unpaved parking lot at County Center II, in El Centro, CA. The project will reduce PM <sub>2.5</sub> and PM <sub>10</sub> emissions, and exposure to the public, thus improving air quality conditions in the PM <sub>2.5</sub> non-attainment area of Imperial County.	Annual Emission Reductions: <ul style="list-style-type: none"> <li>• <b>0.41 tons of PM<sub>2.5</sub></b></li> <li>• <b>3.92 tons of PM<sub>10</sub></b></li> </ul>	Pre- and post- Inspection of the unpaved parking lot (before and after paving); review quarterly performance and conditions reports from I.C. Public Works.

**Component 3 – Reducing Dust Emissions: Unpaved Alleyways (El Centro, CA)**

Activity	Outputs	Outcomes	Performance Measures
Paving City of El Centro unpaved alleyways	Paving up to 11.25 miles of unpaved alleyways throughout El Centro, CA. The project will reduce PM <sub>2.5</sub> and PM <sub>10</sub> emissions, and exposure to the public, thus improving air quality conditions in the PM <sub>2.5</sub> non-attainment area of Imperial County.	Annual Emission Reductions: <ul style="list-style-type: none"> <li>• <b>19.95 tons of PM<sub>2.5</sub></b></li> <li>• <b>193.67 tons of PM<sub>10</sub></b></li> </ul>	Pre- and post- Inspection of the unpaved parking lot (before and after paving); review quarterly performance and conditions reports from I.C. Public Works.

**Component 4 – Reducing Dust Emissions: Unpaved Alleyways (Calexico, CA)**

Activity	Outputs	Outcomes	Performance Measures
Paving City of Calexico unpaved alleyways	Paving up to 3.46 miles of unpaved alleyways throughout Calexico, CA. The project will reduce PM <sub>2.5</sub> and PM <sub>10</sub> emissions, and exposure to the public, thus improving air quality conditions in the PM <sub>2.5</sub> non-attainment area of Imperial County.	Annual Emission Reductions: <ul style="list-style-type: none"> <li>• <b>17.22 tons of PM<sub>2.5</sub></b></li> <li>• <b>170.41 tons of PM<sub>10</sub></b></li> </ul>	Pre- and post- Inspection of the unpaved parking lot (before and after paving); review quarterly performance and conditions reports from the City of Calexico.

**ii. Project Timeline**

The chart below shows the timeline for Components 1 through 4, which consist of paving projects of unpaved sources (school parking lots, the County Center II parking lot, and alleyways) in the PM<sub>2.5</sub> non-attainment area of Imperial County. This timeline illustrates the early implementation of all three aspects of this component to ensure the majority of emission reductions are implemented as quickly as possible:

Components 1 through 4 – Reduce Dust Emissions from School Parking Lots, County Lot & Alleyways									
	2020	2021		2022		2023		2024	
	July-Dec	Jan-June	July-Dec	Jan-June	July-Dec	Jan-June	July-Dec	Jan-June	July-Dec
A. Evaluating Final Project Design, Funding Agreement(s)									
B. Program Implementation/Outreach									
C. Program Evaluation									

**Section 5. Programmatic Capability and Past Performance****i. Organization and Experience**

As previously stated, the ICAPCD is the local Air Pollution Control District for the County of Imperial, sharing responsibility with CARB for ensuring that various state and federal ambient air quality standards are achieved and maintained within the County. As one of California's local Air Pollution Control District's, the ICAPCD is responsible for regional air quality planning, stationary source and facility permitting, and enforcement of local, state, and federal air quality regulations. The ICAPCD enforces air quality regulations at the local level (ICAPCD's Rules and Regulations), various state regulations (i.e. CARB Executive Orders and Airborne Toxic Control Measures), and the federal Clean Air Act.



The ICAPCD administers grant programs with allocated monies from local (Rule 310 Operational Development Fees), state (AB 617 Community Air Protection Program, Carl Moyer Grant Program, FARMER Program), and federal funding sources (U.S. EPA Border Grants, 103 & 105 Grants) to improve the air quality in the region and quality of life for residents in Imperial County. The agency is committed to continue working in partnership with local communities, environmental justice groups, businesses, and the public to administer projects that will improve air quality conditions. Full-time project coordinators, who will coordinate all project activities with clients (i.e. school districts), consultants, contractors, and the community at large, will staff all components of this grant.

The ICAPCD has successfully participated in the California Air Resources Board's Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) Carl Moyer Program for over the past 15 years. The ICAPCD has received and distributed approximately \$7.0 million dollars over this span to assist clients in replacing off-road diesel engines in agricultural equipment such as diesel water pumps, agricultural tractors, and other farming equipment. For the most current funding cycle, Year 21, the ICAPCD has an estimated total of \$387,062 available in funds, which should replace approximately six (6) heavy-duty diesel engines with cleaner Tier 4 Final diesel engines. The ICAPCD recently submitted the application to CARB for Carl Moyer Program Year 22, for the allocation of funds totaling \$419,388.

Secondly, the ICAPCD has also participated in the first two years of CARB's Funding Agricultural Replacement Measures for Emission Reductions (FARMER) Program. This Program, similar to Carl Moyer, assists the ICAPCD in funding vehicle and equipment replacement projects used in agricultural operations that are eligible per Moyer and FARMER Program Guidelines. For the first year of FARMER (FY 2017-18), the ICAPCD received a total award of \$1,186,200 from CARB to implement the Program. With this award, the ICAPCD funded the replacement of eight (8) tractors and seven (7) agricultural water and feed trucks for operators throughout the County (15 total projects). For the second year (FY 2018-19), the ICAPCD was awarded \$1,145,558, and our agency will continue to prioritize funding the replacement of agricultural tractors and trucks. Like Carl Moyer, the goal is to reduce diesel particulate emissions from the agricultural sector, which is a significant contributor to the County's emissions inventory, by replacing older-tiered diesel engines with the latest Tier 4 Final diesel engines.

ICAPCD Rule 310 (Operational Development Fee), adopted in 2007, provides a method for mitigating emissions produced from the operation of new commercial and residential development projects in Imperial County. The fees generated by new developments subject to Rule 310 allow the ICAPCD to redistribute funds for various mitigation projects throughout the County to assist with the attainment status for State and federal ambient air quality standards for PM<sub>10</sub> and Ozone. Each fiscal year, collected funds are allocated through a Request for Proposal (RFP) process for mitigation project proposals based on Staff's analysis of the costs and emissions reductions for each proposal. Since 2007, the ICAPCD has funded the replacement of twelve (12) old diesel agricultural irrigation pumps, one (1) old wastewater treatment pump, thirteen (13) agricultural tractors, two (2) riding lawn mowers, one (1) diesel school bus, and the paving of four (4) community/school unpaved parking lots.

The implementation and success of these above grant programs demonstrates the level of experience in the ICAPCD Staff has in managing awarded funds, reviewing and approving eligible emissions reduction projects, and carrying out in full all required local, State, and federal program administrative requirements.

## ***ii. Staff Qualifications***

The ICAPCD has extensive experience working with various grant programs in all levels of government to assist with funding emissions reductions projects with local partners that will benefit the health and quality of life for residents of Imperial County. Assistant APCO Reyes Romero, APCD Project Managers Belen Leon and Thomas Brinkerhoff, APCD Special Projects Coordinator Katie Burnworth, Analyst Gil Rebollar, and APCD Senior Engineer Israel Hernandez have all served as lead project coordinators for emissions reductions projects funding by grant programs, or have assisted with the analysis and management of these projects from inception to conclusion. Resumes for these listed ICAPCD Staff members can be made available upon request.

## **Section 6. Voluntary Cost Share/Match and Leveraged Funds**

In a collaborative agreement between the City of Calexico, City of El Centro, and the Imperial County Public works, these agencies provided an estimate of the project costs and is reflected on the budget table below. However, the School parking lots is based on an average on the cost of past parking lots completed the ICAPCD under Rule 310 Operations Development Fee with similar characteristics. Due to the estimates indicated in the Budget table below, the ICAPCD will leverage 10% of funds for unforeseen expenses. In addition, the ICAPCD included 10% contingency as indirect cost and will be leverage funds for unforeseen expenses.

In addition, the ICAPCD will leverage funds for all indirect costs to carry out this project. In addition, all additional staff who that may be requested to work on this project in the next 4 ½ years will also be paid by leverage funding.

## **Section 7. Budget Narrative**

Two staff members of the ICAPCD will be assigned to the project. Both staff members are Project Managers, Belen Leon and Thomas Brinkerhoff. Because the ICAPCD has very limited resources, the two employees of the ICAPCD will assist in the administration and implementation of the projects. In order to determine the amount of weeks worked each year, the ICAPCD subtracted earned vacation, sick leave and holidays from the 52 weeks in each year. The two Project Manager's at the ICAPCD will keep track of hours spent on projects on the ICAPCD's payroll database. In a collaborative agreement between the City of Calexico, City of El Centro, and the Imperial County Public works, these agencies provided an estimate of the project costs and is reflected on the budget table below.

In order to carry out the project, the ICAPCD has projected that all projects will take place over four and a half years: 2021, 2022, 2023, 2024, and 2025 (partial).

The two employees of the ICAPCD receive 32 percent of salary and wages for fringe benefits. Fringe benefits consist of retirement benefits, health, vision, and dental benefits. The overwhelming proportion of the request for the EPA funding will go towards the implementation and paving of all the projects. ICAPCD will work with the Imperial County Department of Public Works (ICPWD), City of Calexico, City of El Centro, and the Imperial County School Districts, to implement the paving projects.

Component 1: Paving of the 5 school unpaved lots vary by school between 10,000 sqft to 35,000 sqft. The cumulative area that will be paved between all school lots is approximately 109,000 sqft. Component 2: County Center II and the unpaved area is of 46,000 sqft. Component 3: City of El Centro identified 11.25 miles of unpaved alley areas of throughout El Centro. Component 4: The City of Calexico identified 3.46 miles of unpaved alley ways. The unpaved areas identified above are emissions reduction projects that will directly reduce particulate matter emissions directly in the PM2.5 non-attainment area. In collaborate agreement, the City of Calexico, City of El Centro, and the Imperial County Public Works, provided an estimate on the project costs and is reflected on the budget table below. The School parking lots is based on an average on the cost of past parking lots completed the ICAPCD under Rule 310 Operations Development Fee with similar characteristics. Due to the estimates indicated in the Budget table below, the ICAPCD will leverage 10% of funds for unforeseen project expenses.

The ICAPCD reserves the right to modify the allocation of resources in order to achieve maximum emission reductions and project completions.

The table below provides a detailed breakdown of the approximate funding used for the component task. The ICAPCD is not requesting any funding for the following: travel, equipment, supplies, Contractual, Construction, and indirect costs.

**Proposed Budget for Components 1 through 4**

				<b>Grant Funds</b>	<b>Leveraged Funds</b>
<b>A</b>	<b>Personnel</b>				
	Project Manager 2 @ \$40/hr x 30hrs/wk x 52 wks x 4.5 yrs		<b>561,600</b>		
	Component 1: 25% of total hours			140,400	
	Component 2: 25% of total hours			140,400	
	Component 3: 25% of total hours			140,400	
	Component 4: 25% of total hours			140,400	
	<b>Subtotal</b>			<b>\$561,600</b>	
<b>B</b>	<b>Fringe Benefits</b>				
<b>I</b>	<b>Personnel</b>				
	Fringe benefits @ 32%			179,712	
	<i>FICA, Life Ins, Workers' Comp, Retirement, Health Ins</i>				
	<b>Subtotal</b>			<b>\$179,712</b>	
<b>C</b>	<b>Travel</b>			<b>0</b>	
<b>D</b>	<b>Equipment</b>			<b>0</b>	
<b>E</b>	<b>Supplies</b>			<b>0</b>	
<b>F</b>	<b>Contractual</b>			<b>0</b>	
<b>G</b>	<b>Construction</b>			<b>0</b>	
<b>H</b>	<b>Other/Collaborative agreement</b>			<b>0</b>	
	Component 1 – School Parking Lots	5	325,000	1,625,000	
	10% Contingency				130,000
	Component 2 – Sheriff Lot			609,050	
	10% Contingency				60,905
	Component 3 – El Centro			9,823,697	
	Component 4 – Calexico			3,352,729	
<b>I</b>	<b>Indirect Cost -</b>				
	<b>Total</b>			<b>0</b>	190,905
	<b>Subtotals - Grant Funds &amp; Leveraged Funds</b>			<b>\$16,151,788</b>	<b>\$190,905</b>
	<b>GRAND TOTAL</b>			<b>\$16,151,788</b>	<b>\$190,905</b>

**Section 8. Attachments**

Attachment A. Emissions Inventories

Attachment B. Emissions Reduction Calculations

Attachment C. Letters of Support/Partnership

## **ATTACHMENT A. EMISSIONS INVENTORIES**



On December 14, 2012, USEPA issued a final rule revising the PM<sub>2.5</sub> NAAQS by lowering the primary annual PM<sub>2.5</sub> standard from 15 µg/m<sup>3</sup> to 12 µg/m<sup>3</sup> to provide increased protection against health effects associated with long- and short-term fine particle exposures. The USEPA retained the primary 24-hour PM<sub>2.5</sub> standard of 35 µg/m<sup>3</sup> and the existing secondary (welfare-based) annual PM<sub>2.5</sub> standard of 15 µg/m<sup>3</sup>. In April 2015, Imperial County was classified as a Moderate PM<sub>2.5</sub> nonattainment area for the annual PM<sub>2.5</sub> primary standard of 12 µg/m<sup>3</sup>. The PM<sub>2.5</sub> nonattainment area for the 2012 Annual PM<sub>2.5</sub> NAAQS includes the same area covered under the 2006 24-hour PM<sub>2.5</sub> Moderate nonattainment area.

The non-attainment area contains a handful of emissions source categories that significantly contribute to the PM<sub>2.5</sub> nonattainment status, such as vehicular traffic, unpaved road dust, fugitive windblown dust, farming operations, managed burning and disposal, and aircraft. Based on the emissions inventory data included in the 2018 Annual PM<sub>2.5</sub> SIP, unpaved road dust emissions, classified as an area wide emissions source, account for 36% of the PM<sub>2.5</sub> emissions in Imperial County. For fugitive windblown dust, which is also an area wide emissions source, these emissions based on the 2018 Annual PM<sub>2.5</sub> SIP account for 32% of the PM<sub>2.5</sub> emissions in the County. Given these figures, it is apparent that unpaved road and fugitive dust emissions are both major contributors to the nonattainment status of Imperial County; however, mitigation of these emissions can be achieved via the implementation of paving projects at school/public parking lots and alleyways in the Cities of Calexico and El Centro. The school/county parking lot paving projects and the City of Calexico and El Centro Alleyway paving projects will have a direct PM<sub>10</sub> and PM<sub>2.5</sub> emissions reduction on the Imperial County Unpaved Road Travel Dust – City and County Roads Category (EIC: 645-638-5400-0000) and Windblown Dust – Unpaved Roads Category (EIC: 650-652-5400-0000). The projects will have a slight increase in the Paved Entrained Road Travel Dust – Local Streets Category (EIC: 640-641-5400-0000).

Table 1, below indicates the estimated emissions reduction from the paving of (5) school parking lots, the County Center II parking lot and alleyways in the Cities of Calexico and El Centro. Table 1, is a summary of all expected emissions reductions from components 1 through 4. Component 1 is the paving of (5) school parking lots, component 2 is the paving of County II parking lot, component 3 is the paving of alleyways in the City of El Centro and component 4 is the paving of alleyways in the City of Calexico. Refer to Attachment B, *Emissions Reduction Calculations* for a complete description of the emissions calculations.

**Table 1: Paving Project PM<sub>2.5</sub> and PM<sub>10</sub> Emissions Reductions**

<b>Category</b>	<b>PM<sub>2.5</sub> (tons/yr)</b>	<b>PM<sub>10</sub> (tons/yr)</b>
Unpaved Road Travel Dust – City and County Roads (EIC: 645-638-5400-0000)	35.39	353.86
Windblown Dust – Unpaved Roads (EIC: 650-652-5400-0000)	3.48	26.32
<b>Total Unpaved Road Emissions</b>	<b>38.87</b>	<b>380.18</b>
Paved Entrained Road Travel Dust – Local Streets (EIC: 640-641-5400-0000)	0.05	0.34
<b>Total Project/Inventory Emission Reductions (tons/year)</b> (Unpaved Road Emissions minus Paved Road Emissions)	<b>38.82</b>	<b>379.84</b>
<b>Total Project/Inventory Emission Reductions (tons/day)</b>	<b>0.11</b>	<b>1.04</b>

Note: Refer to Attachment B (Emissions Reduction Calculations) for Emission Calculations

Chapter 6, of the Imperial County 2018 Annual PM<sub>2.5</sub> SIP demonstrates that Imperial County will satisfy Reasonable Further Progress (RFP) by reducing PM<sub>2.5</sub> emissions. Table 2 below was produced using the California Emissions Projection Analysis Model (CEPAM) version 1.05, which was used for the Imperial County 2018 Annual PM<sub>2.5</sub> SIP. Table 2 below was included in this document to show the 2012, 2019 and 2022 PM<sub>2.5</sub> Emission Inventory Trend for the Unpaved Road Travel Dust – City and County Roads Category (EIC: 645-638-5400-0000), Windblown Dust – Unpaved Roads Category (EIC: 650-652-5400-0000) and the Paved Entrained Road Travel Dust – Local Streets Category (EIC: 640-641-5400-0000). The paving of (5) school parking lots, the County Center II parking lot and alleyways in the Cities of Calexico and El Centro will reduce direct PM<sub>2.5</sub> in these Categories and allow Imperial County to get closer to meeting its RFP obligation.

**Table 2: 2012, 2019, and 2022 PM<sub>2.5</sub> CEPAM V 1.05 Emissions Inventory Trend**

Category	2012	2019	2022
Unpaved Road Travel Dust – City and County Roads (EIC: 645-638-5400-0000)	2.089	1.481	1.352
Windblown Dust – Unpaved Roads & Associated Areas (EIC: 650-652-5400-0000)	2.618	2.618	2.618
Paved Entrained Road Travel Dust – Local Streets (EIC: 640-641-5400-0000)	0.064	0.078	0.087

### *Methodology*

The methodologies used to calculate emissions reductions from the paving of (5) school parking lots, the County Center II parking lot and alleyways in the Cities of Calexico and El Centro are the methodologies that were used in the Imperial County 2018 Annual Particulate Matter Less Than 2.5 Microns In Diameter State Implementation Plan. These methodologies were used in order to have a direct correlation from the calculated emission reductions and the Imperial County Emissions Inventory.

Component 1 of the proposed project proposes to pave (5) school parking lots. The emission reductions were calculated in Attachment B by getting the average of two types of school parking lots, high use parking lot and moderate use parking lot. Component 2 of the proposed project proposes to pave the County Center II parking lot. Components 3 and 4 proposes to pave alleyways in the cities of Calexico and El Centro. In order to calculate emissions reduction (4) Methodologies were used and each is described below.

California Air Resources Board (CARB), Miscellaneous Process Methodology 7.10, *Unpaved Road Dust, Non-Farm Roads* was used to calculate unpaved fugitive PM<sub>10</sub> and PM<sub>2.5</sub> emissions from the travel on the unpaved parking lots and the unpaved alleyways, which are accounted in the Imperial County Unpaved Road Travel Dust – City and County Roads under Emissions Inventory Category (EIC: 645-638-5400-0000). Additional information on this methodology is available at: [https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-10\\_2012.pdf](https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-10_2012.pdf).

#### *Unpaved Parking Lot Sample*

An Emission Factor (EF) of 2 lbs PM<sub>10</sub> and 0.2 lbs PM<sub>2.5</sub> (10% of PM<sub>10</sub>) per vehicle miles travelled (VMT) are used, based on Change of Methodology section found on page 6 of the methodology 7.10. The vehicle count per day is 50, and the lot is used throughout the year by school staff, families and community members. VMT's are derived by using 0.10 miles for every vehicle round trip, with the "L-shape" configuration of the lot being 25,500 sq. ft. (0.59 acres) and an annual vehicle trip count of 18,250.

Vehicle Miles Travelled (VMT) = 0.10 miles/vehicle (18,250 vehicles/yr)  
= 1,825 VMT/yr

Unpaved PM<sub>10</sub> Emissions = 2.0 lbs PM<sub>10</sub>/VMT × 1,825 VMT/yr  
= 3,650 lbs PM<sub>10</sub>/yr; **1.83 tons PM<sub>10</sub>/yr**

Unpaved PM<sub>2.5</sub> Emissions = 0.2 lbs PM<sub>2.5</sub>/VMT × 1,825 VMT/yr  
= 365.0 lbs PM<sub>2.5</sub>/yr; **0.18 tons PM<sub>2.5</sub>/yr**

#### *Unpaved Alleyway Sample*

An Emission Factor (EF) of 2 lbs PM<sub>10</sub> and 0.2 lbs PM<sub>2.5</sub> (10% of PM<sub>10</sub>) per vehicle miles travelled (VMT) are used, based on Change of Methodology section found on page 6 of the methodology 7.10. VMT's are derived by using 11.25 miles (59,420 linear feet), which includes the sum length of the network of unpaved alleyways proposed for paving by the City of El Centro. The average daily trips (ADT) of 42.78 will be applied to the 11.25 miles of unpaved alleyways, since this is the total average of daily trips for the 107 unpaved alleyway segments in El Centro, CA.

Vehicle Miles Travelled = 11.25 miles (42.78 ADT) = 481.275 VMT/day

Unpaved PM<sub>10</sub> Emissions = 2 lbs PM<sub>10</sub>/VMT × 481.275 VMT/day  
= 962.55 lbs PM<sub>10</sub>/day; 0.481 tons PM<sub>10</sub>/day  
= 0.481 tons PM<sub>10</sub>/day × 365 days/yr  
= **175.67 tons PM<sub>10</sub>/yr**

Unpaved PM<sub>2.5</sub> Emissions = 0.2 lbs PM<sub>2.5</sub>/VMT × 481.275 VMT/day  
= 96.26 lbs PM<sub>2.5</sub>/day; 0.048 tons PM<sub>2.5</sub>/day  
= 0.048 tons PM<sub>2.5</sub>/day × 365 days/yr  
= **17.57 tons PM<sub>2.5</sub>/yr**

California Air Resources Board (CARB), Windblown Dust – Unpaved Roads Section 7.13 Methodology was used to calculate Windblown fugitive PM<sub>10</sub> and PM<sub>2.5</sub> emissions from the unpaved parking lots and the unpaved alleyways, which are accounted in the Imperial County Windblown Dust – Unpaved Roads under Emissions Inventory Category (EIC: 650-652-5400-0000). Additional information on this methodology is available at: <https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-13.pdf>.

#### *Windblown Parking Lot Sample*

Existing unpaved Windblown PM<sub>10</sub> and PM<sub>2.5</sub> emissions from one moderate-use school parking lot is calculated using a 0.59 acre area (25,500 sq. ft) and the CARB Windblown Dust – Unpaved Roads Section 7.13 Methodology. Additional information on this methodology is available at: <https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-13.pdf>. An Emission Factor (EF) of 2,665 TSP lbs/acre/yr. The TSP emissions factor is converted to 1,333 PM<sub>10</sub> lbs/acre/yr by multiplying by 0.5, as specified in the 7.13 methodology. PM<sub>2.5</sub> is calculated as 13.2 percent of PM<sub>10</sub>, which is the ARB particle size profile used in the Updating Imperial County PM<sub>2.5</sub> NAA Windblown Dust Emissions document – ([https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014\\_impwbd.pdf](https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014_impwbd.pdf)).

$$\begin{aligned}\text{Windblown PM}_{10} \text{ Emissions} &= 1,333 \text{ lbs PM}_{10}/\text{acre}/\text{yr} \times 0.59 \text{ acres} \\ &= 786.47 \text{ lbs PM}_{10}/\text{yr}; \mathbf{0.39 \text{ tons PM}_{10}/\text{yr}}\end{aligned}$$

$$\begin{aligned}\text{Windblown PM}_{2.5} \text{ Emissions} &= 0.39 \text{ tons PM}_{10}/\text{yr} \times 0.132 \text{ PM}_{2.5}/\text{PM}_{10} \\ &= \mathbf{0.05 \text{ tons PM}_{2.5}/\text{yr}}\end{aligned}$$

#### *Windblown Alleyway Sample*

Existing Windblown PM<sub>10</sub> and PM<sub>2.5</sub> emissions from unpaved alleyways in the City of El Centro are calculated using the CARB Windblown Dust – Unpaved Roads Section 7.13 Methodology. Additional information on this methodology is available at: <https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-13.pdf>. An Emission Factor (EF) of 3,230 lbs PM<sub>10</sub>/mile is used based on the methodology mentioned above. 11.25 miles was used as described above in the unpaved parking lot sample. PM<sub>2.5</sub> is calculated as 13.2 percent of PM<sub>10</sub>, which is the ARB particle size profile used in the Updating Imperial County PM<sub>2.5</sub> NAA Windblown Dust Emissions document ([https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014\\_impwbd.pdf](https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014_impwbd.pdf)).

$$\begin{aligned}\text{Windblown PM}_{10} \text{ Emissions} &= 3,230 \text{ lbs PM}_{10}/\text{mile} \times 11.25 \text{ miles} \\ &= 36,337.5 \text{ lbs PM}_{10}/\text{yr}; \mathbf{18.17 \text{ tons PM}_{10}/\text{yr}}\end{aligned}$$

$$\begin{aligned}\text{Windblown PM}_{2.5} \text{ Emissions} &= 18.17 \text{ tons PM}_{10}/\text{yr} \times 0.132 \text{ PM}_{2.5}/\text{PM}_{10} \\ &= \mathbf{2.40 \text{ tons PM}_{2.5}/\text{yr}}\end{aligned}$$

California Air Resources Board (CARB), Miscellaneous Process Methodology 7.9, *Entrained Road Travel, Paved Road Dust* was used to calculate Paved Entrained Road PM<sub>10</sub> and PM<sub>2.5</sub> emissions from the unpaved parking lots and the unpaved alleyways, which are accounted in the Imperial County Paved Entrained Road Travel Dust – Local Streets under Emissions Inventory Category (EIC: 640-641-5400-0000). Additional information on this methodology is available at: [https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9\\_2018.pdf](https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf).

*Paved Parking lot/Alleyway Sample – Same process was used to calculate paved emissions for parking lots and alleyways.*

El Centro Alleyways sample. VMT's are derived by using 11.25 miles (59,420 linear feet), which includes the sum length of the network of unpaved alleyways proposed for paving by the City of El Centro. The average daily trips (ADT) of 42.78 will be applied to the 11.25 miles of unpaved alleyways, since this is the total average of daily trips for the 107 unpaved alleyway segments in El Centro, CA.

$$\text{Vehicle Miles Travelled} = 11.25 \text{ miles (42.78 ADT)} = 481.275 \text{ VMT/day}$$

Emissions calculations are calculate below by following the sample calculation on page 11 of Miscellaneous Process Methodology 7.9.

$$\text{PM}_{10} \text{ E.F.} = [k (\text{sL})^{0.91} \times (\text{W})^{1.02}] \times (1 - \text{P}/4\text{N})$$



Where;

factor	PM 10	
k =	0.0022	EPA AP-42 Table 13.2.1-1
sL =	0.32 (g/m <sup>2</sup> )	Table 7, ARB – Misc. Process Methodology 7.9
W =	2.4 tons	California statewide default
P =	11	Table 7, ARB – Misc. Process Methodology 7.9
N =	365	No. of days in averaging period

$$\begin{aligned}
 \text{PM}_{10} \text{ E.F.} &= [0.0022 (0.32) 0.91 \times (2.4) 1.02] \times (1 - 11/4(365)) \\
 &= (0.0022 \times 0.355 \times 2.44) \times (1 - 11/1460) \\
 &= (0.0019) \times (0.992)
 \end{aligned}$$

$$\text{PM}_{10} \text{ E.F.} = 0.00189 \text{ lbs PM}_{10}/\text{VMT}$$

$$\begin{aligned}
 \text{Paved Road PM}_{10} \text{ Emissions} &= 0.00189 \text{ lbs PM}_{10}/\text{VMT} \times 481.275 \text{ VMT/day} \\
 &= 0.910 \text{ lbs PM}_{10}/\text{Day} \\
 &= 0.910 \text{ lbs PM}_{10}/\text{Day} \times 365 \text{ days/yr} \\
 &= 332.01 \text{ lbs PM}_{10}/\text{yr}; \mathbf{0.166 \text{ tons PM}_{10}/\text{yr}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Paved Road PM}_{2.5} \text{ Emissions} &= \text{tons/yr PM}_{10} \times \text{Fraction (PM}_{2.5}/\text{PM}_{10}) \\
 &= 0.166 \text{ tons PM}_{10}/\text{yr} \times (0.0686/0.4572) \\
 &= \mathbf{0.025 \text{ tons PM}_{2.5}/\text{yr}}
 \end{aligned}$$

## **ATTACHMENT B. EMISSIONS REDUCTION CALCULATIONS**

## Component 1 – Reducing Dust Emissions from Unpaved School Lots

Component 1, consisting of the paving of five (5) unpaved parking lots in schools throughout Imperial County, addresses directly emitted PM<sub>10</sub> and PM<sub>2.5</sub> emissions due to disturbances of the surface of the unpaved parking lots. The following is an analysis of the emissions reduction calculations as a result of paving five (5) unpaved school parking lots, and all stated methodologies were also used in the Imperial County 2018 Annual PM<sub>2.5</sub> SIP. The total emissions reductions is based on the conservative assumption of averaging the emissions savings from one (1) heavily-used school parking lot, and one (1) moderately used school parking lot, and applying that to 5 parking lot paving projects at schools within the PM<sub>2.5</sub> non-attainment area of Imperial County:

### *Existing Project Emissions (High-Use Lot)*

Existing unpaved fugitive PM<sub>10</sub> and PM<sub>2.5</sub> emissions from one heavy-use school parking lot are calculated using the CARB Miscellaneous Process Methodology 7.10, *Unpaved Road Dust, Non-Farm Roads*. Additional information on this methodology is available at: [https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-10\\_2012.pdf](https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-10_2012.pdf). An Emission Factor (EF) of 2 lbs PM<sub>10</sub> and 0.2 lbs PM<sub>2.5</sub> per vehicle miles travelled (VMT) are used, based on the methodology 7.10. The staff and student family vehicle count per day is 500, 5 days per week, for 10 months per year, which totals 108,500 vehicles per year. VMT's are derived by using 0.02 miles for every vehicle round trip, and a total unpaved parking area of 22,648 sq. ft.

$$\begin{aligned}\text{Vehicle Miles Travelled (VMT)} &= 0.02 \text{ miles/vehicle} (108,500 \text{ vehicles/yr}) \\ &= 2,170 \text{ VMT/yr}\end{aligned}$$

$$\begin{aligned}\text{Unpaved PM}_{10} \text{ Emissions} &= 2.0 \text{ lbs PM}_{10}/\text{VMT} \times 2,170 \text{ VMT/yr} \\ &= 4,340 \text{ lbs PM}_{10}/\text{yr}; \mathbf{2.17 \text{ tons PM}_{10}/\text{yr}}\end{aligned}$$

$$\begin{aligned}\text{Unpaved PM}_{2.5} \text{ Emissions} &= 0.2 \text{ lbs PM}_{2.5}/\text{VMT} \times 2,170 \text{ VMT/yr} \\ &= 434.0 \text{ lbs PM}_{2.5}/\text{yr}; \mathbf{0.22 \text{ tons PM}_{2.5}/\text{yr}}\end{aligned}$$

Existing unpaved Windblown PM<sub>10</sub> and PM<sub>2.5</sub> emissions from one heavy-use school Parking Lot is calculated using a 0.52 acre area (22,648 sq. ft) and the CARB Windblown Dust – Unpaved Roads Section 7.13 Methodology. Additional information on this methodology is available at: <https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-13.pdf>. An Emission Factor (EF) of 2,665 TSP lbs/acre/yr. The TSP emissions factor is converted to 1,333 PM<sub>10</sub> lbs/acre/yr by multiplying by 0.5, as specified in the 7.13 methodology. PM<sub>2.5</sub> is calculated as 13.2 percent of PM<sub>10</sub>, which is the ARB particle size profile used in the Updating Imperial County PM<sub>2.5</sub> NAA Windblown Dust Emissions document – ([https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014\\_impwbd.pdf](https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014_impwbd.pdf)).

$$\begin{aligned}\text{Windblown PM}_{10} \text{ Emissions} &= 1,333 \text{ lbs PM}_{10}/\text{acre/yr} \times 0.52 \text{ acres} \\ &= 693.16 \text{ lbs PM}_{10}/\text{yr}; \mathbf{0.35 \text{ tons PM}_{10}/\text{yr}}\end{aligned}$$

$$\begin{aligned}\text{Windblown PM}_{2.5} \text{ Emissions} &= 0.35 \text{ tons PM}_{10}/\text{yr} \times 0.132 \text{ PM}_{2.5}/\text{PM}_{10} \\ &= \mathbf{0.05 \text{ tons PM}_{2.5}/\text{yr}}\end{aligned}$$

### *Post-Construction/Paved Emissions (High-Use Lot)*

Post-construction (paved) PM<sub>10</sub> and PM<sub>2.5</sub> emissions are calculated using the CARB Miscellaneous Process Methodology 7.9, *Entrained Road Travel, Paved Road Dust*. Additional information on this methodology is

available at: [https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9\\_2018.pdf](https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf).

$$\begin{aligned}\text{Vehicle Miles Travelled (VMT)} &= 0.02 \text{ miles/vehicle (108,500 vehicles/yr)} \\ &= 2,170 \text{ VMT/yr}\end{aligned}$$

Emissions calculations are calculated below by following the sample calculation on page 11 of Miscellaneous Process Methodology 7.9.

$$\text{PM}_{10} \text{ E.F.} = [k (\text{sL})^{0.91} \times (\text{W})^{1.02}] \times (1 - \text{P}/4\text{N})$$

Where;

factor	PM 10	
k =	0.0022	EPA AP-42 Table 13.2.1-1
sL =	0.32 (g/m <sup>2</sup> )	Table 7, ARB – Misc. Process Methodology 7.9
W =	2.4 tons	California statewide default
P =	11	Table 7, ARB – Misc. Process Methodology 7.9
N =	365	No. of days in averaging period

$$\begin{aligned}\text{PM}_{10} \text{ E.F.} &= [0.0022 (0.32)^{0.91} \times (2.4)^{1.02}] \times (1 - 11/4(365)) \\ &= (0.0022 \times 0.355 \times 2.44) \times (1 - 11/1460) \\ &= (0.0019) \times (0.992)\end{aligned}$$

$$\text{PM}_{10} \text{ E.F.} = 0.00189 \text{ lbs PM}_{10}/\text{VMT}$$

$$\begin{aligned}\text{Paved Parking Lot PM}_{10} \text{ Emissions} &= 0.00189 \text{ lbs PM}_{10}/\text{VMT} \times 2,170 \text{ VMT/yr} \\ &= 4.10 \text{ lbs PM}_{10}/\text{yr}; \mathbf{0.002 \text{ tons PM}_{10}/\text{yr}}\end{aligned}$$

$$\begin{aligned}\text{Paved Parking Lot PM}_{2.5} \text{ Emissions} &= \text{tons/yr PM}_{10} \times \text{Fraction (PM}_{2.5}/\text{PM}_{10}) \\ &= 0.002 \text{ tons PM}_{10}/\text{yr} \times (0.0686/0.4572) \\ &= \mathbf{0.0003 \text{ tons PM}_{2.5}/\text{yr}}\end{aligned}$$

*Total Emissions Reductions (High-Use Lot)*

Unpaved School Parking Lot Emissions	PM 10 (tons/yr)	PM2.5 (tons/yr)
Unpaved Parking Lot Emissions	2.17	0.22
Unpaved Windblown Emissions	0.35	0.05
Total Unpaved Emissions	2.52	0.27
<b>Paved Parking Lot Emissions</b>	0.002	0.0003
<b>Total Emission Reductions</b>	<b>2.52</b>	<b>0.27</b>

*Existing Project Emissions (Moderate-Use Lot)*

Existing unpaved fugitive PM<sub>10</sub> and PM<sub>2.5</sub> emissions from one moderate-use school parking lot are calculated using the CARB Miscellaneous Process Methodology 7.10, *Unpaved Road Dust, Non-Farm Roads*. Additional information on this methodology is available at: [https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-10\\_2012.pdf](https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-10_2012.pdf).



An Emission Factor (EF) of 2 lbs PM<sub>10</sub> and 0.2 lbs PM<sub>2.5</sub> per vehicle miles travelled (VMT) are used, based on the methodology 7.10. The vehicle count per day is 50, and the lot is used throughout the year by school staff and families and community members. VMT's are derived by using a 0.10 miles for every vehicle round trip, with the "L-shape" configuration of the lot being 25,500 sq. ft., and an annual vehicle trip count of 18,250.

$$\begin{aligned}\text{Vehicle Miles Travelled (VMT)} &= 0.10 \text{ miles/vehicle (18,250 vehicles/yr)} \\ &= 1,825 \text{ VMT/yr}\end{aligned}$$

$$\begin{aligned}\text{Unpaved PM}_{10} \text{ Emissions} &= 2.0 \text{ lbs PM}_{10}/\text{VMT} \times 1,825 \text{ VMT/yr} \\ &= 3,650 \text{ lbs PM}_{10}/\text{yr}; \mathbf{1.83 \text{ tons PM}_{10}/\text{yr}}\end{aligned}$$

$$\begin{aligned}\text{Unpaved PM}_{2.5} \text{ Emissions} &= 0.2 \text{ lbs PM}_{2.5}/\text{VMT} \times 1,825 \text{ VMT/yr} \\ &= 365.0 \text{ lbs PM}_{2.5}/\text{yr}; \mathbf{0.18 \text{ tons PM}_{2.5}/\text{yr}}\end{aligned}$$

Existing unpaved Windblown PM<sub>10</sub> and PM<sub>2.5</sub> emissions from one moderate-use school parking lot is calculated using a 0.59 acre area (25,500 sq. ft) and the CARB Windblown Dust – Unpaved Roads Section 7.13

Methodology. Additional information on this methodology is available at:

<https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-13.pdf>. An Emission Factor (EF) of 2,665 TSP lbs/acre/yr. The TSP emissions factor is converted to 1,333 PM<sub>10</sub> lbs/acre/yr by multiplying by 0.5. as specified in the 7.13 methodology. PM<sub>2.5</sub> is calculated as 13.2 percent of PM<sub>10</sub>, which is the ARB particle size profile used in the Updating Imperial County PM<sub>2.5</sub> NAA Windblown Dust Emissions document – ([https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014\\_impwbd.pdf](https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014_impwbd.pdf)).

$$\begin{aligned}\text{Windblown PM}_{10} \text{ Emissions} &= 1,333 \text{ lbs PM}_{10}/\text{acre/yr} \times 0.59 \text{ acres} \\ &= 786.47 \text{ lbs PM}_{10}/\text{yr}; \mathbf{0.39 \text{ tons PM}_{10}/\text{yr}}\end{aligned}$$

$$\begin{aligned}\text{Windblown PM}_{2.5} \text{ Emissions} &= 0.39 \text{ tons PM}_{10}/\text{yr} \times 0.132 \text{ PM}_{2.5}/\text{PM}_{10} \\ &= \mathbf{0.05 \text{ tons PM}_{2.5}/\text{yr}}\end{aligned}$$

#### *Post-Construction/Paved Emissions (Moderate-Use Lot)*

Post-construction (paved) PM<sub>10</sub> and PM<sub>2.5</sub> emissions are calculated using the CARB Miscellaneous Process Methodology 7.9, *Entrained Road Travel, Paved Road Dust*. Additional information on this methodology is available at: [https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9\\_2018.pdf](https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf).

$$\begin{aligned}\text{Vehicle Miles Travelled (VMT)} &= 0.10 \text{ miles/vehicle (18,250 vehicles/yr)} \\ &= 1,825 \text{ VMT/yr}\end{aligned}$$

Emissions calculations are calculated below by following the sample calculation on page 11 of Miscellaneous Process Methodology 7.9.

$$\text{PM}_{10} \text{ E.F.} = [k (\text{sL})^{0.91} \times (\text{W})^{1.02}] \times (1 - \text{P}/4\text{N})$$

Where;

factor	PM 10	
k =	0.0022	EPA AP-42 Table 13.2.1-1
sL =	0.32 (g/m <sup>2</sup> )	Table 7, ARB – Misc. Process Methodology 7.9
W =	2.4 tons	California statewide default
P =	11	Table 7, ARB – Misc. Process Methodology 7.9
N =	365	No. of days in averaging period

$$\begin{aligned}
 \text{PM}_{10} \text{ E.F.} &= [0.0022 (0.32) 0.91 \times (2.4) 1.02] \times (1 - 11/4(365)) \\
 &= (0.0022 \times 0.355 \times 2.44) \times (1 - 11/1460) \\
 &= (0.0019) \times (0.992) \\
 \text{PM}_{10} \text{ E.F.} &= 0.00189 \text{ lbs PM}_{10}/\text{VMT}
 \end{aligned}$$

$$\begin{aligned}
 \text{Paved Parking Lot PM}_{10} \text{ Emissions} &= 0.00189 \text{ lbs PM}_{10}/\text{VMT} \times 1,825 \text{ VMT/yr} \\
 &= 3.45 \text{ lbs PM}_{10}/\text{yr}; \mathbf{0.002 \text{ tons PM}_{10}/\text{yr}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Paved Parking Lot PM}_{2.5} \text{ Emissions} &= \text{tons/yr PM}_{10} \times \text{Fraction (PM}_{2.5}/\text{PM}_{10}) \\
 &= 0.002 \text{ tons PM}_{10}/\text{yr} \times (0.0686/0.4572) \\
 &= \mathbf{0.0003 \text{ tons PM}_{2.5}/\text{yr}}
 \end{aligned}$$

*Total Emissions Reductions (Moderate-Use Lot)*

<b>Unpaved School Parking Lot Emissions</b>	<b>PM 10 (tons/yr)</b>	<b>PM2.5 (tons/yr)</b>
Unpaved Parking Lot Emissions	1.83	0.18
Unpaved Windblown Emissions	0.39	0.05
Total Unpaved Emissions	2.22	0.23
<b>Paved Parking Lot Emissions</b>	0.002	0.0003
<b>Total Emission Reductions</b>	<b>2.22</b>	<b>0.23</b>

*Component 1 Total Emissions Reductions (5 School Parking Lots)*

<b>Category</b>	<b>PM 10 (tons/yr)</b>	<b>PM2.5 (tons/yr)</b>
<b>Emissions Reduction Per Project</b>	2.37	0.25
<b>Total Emission Reductions (5 Paving Projects)</b>	<b>11.85</b>	<b>1.25</b>

## Component 2 – Reducing Dust Emissions form Unpaved County Lot

Component 2 aims to reduce PM<sub>10</sub> and PM<sub>2.5</sub> emissions from dust generated due to disturbances of the surface of the County Center II unpaved parking lot located at 328 Applestill Road, El Centro, CA. The following is an analysis of the emissions reduction calculations for paving the 46,000 sq. ft. unpaved parking lot. The stated methodologies in the below sections were the same methods used in the Imperial County 2018 Annual PM<sub>2.5</sub> SIP:

### *Existing Project Emissions*

Existing unpaved fugitive PM<sub>10</sub> and PM<sub>2.5</sub> emissions from the County Center II parking lot are calculated using the CARB Miscellaneous Process Methodology 7.10, *Unpaved Road Dust, Non-Farm Roads*. Additional information on this methodology is available at: [https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-10\\_2012.pdf](https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-10_2012.pdf). An Emission Factor (EF) of 2 lbs PM<sub>10</sub> and 0.2 lbs PM<sub>2.5</sub> per vehicle miles travelled (VMT) are used, based on the methodology 7.10. VMTs are derived by using 0.08 miles for every vehicle round trip at the 46,000 sq. ft. parking lot and an annual vehicle trip count of 40,172.

$$\begin{aligned}\text{Vehicle Miles Travelled (VMT)} &= 0.08 \text{ miles/vehicle (40,172 vehicles/yr)} \\ &= 3,214 \text{ VMT/yr}\end{aligned}$$

$$\begin{aligned}\text{Unpaved PM}_{10} \text{ Emissions} &= 2.0 \text{ lbs PM}_{10}/\text{VMT} \times 3,214 \text{ VMT/yr} \\ &= 6,428 \text{ lbs PM}_{10}/\text{yr}; \textbf{3.21 tons PM}_{10}/\text{yr}\end{aligned}$$

$$\begin{aligned}\text{Unpaved PM}_{2.5} \text{ Emissions} &= 0.2 \text{ lbs PM}_{2.5}/\text{VMT} \times 3,214 \text{ VMT/yr} \\ &= 643 \text{ lbs PM}_{2.5}/\text{yr}; \textbf{0.32 tons PM}_{2.5}/\text{yr}\end{aligned}$$

Existing unpaved Windblown PM<sub>10</sub> and PM<sub>2.5</sub> emissions from the parking lot is calculated using a 1.06 acre area (46,000 sq. ft) and the CARB Windblown Dust – Unpaved Roads Section 7.13 Methodology. Additional information on this methodology is available at: <https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-13.pdf>. An Emission Factor (EF) of 2,665 TSP lbs/acre/yr. The TSP emissions factor is converted to 1,333 PM<sub>10</sub> lbs/acre/yr by multiplying by 0.5. as specified in the 7.13 methodology. PM<sub>2.5</sub> is calculated as 13.2 percent of PM<sub>10</sub>, which is the ARB particle size profile used in the Updating Imperial County PM<sub>2.5</sub> NAA Windblown Dust Emissions document – ([https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014\\_impwbd.pdf](https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014_impwbd.pdf)).

$$\begin{aligned}\text{Windblown PM}_{10} \text{ Emissions} &= 1,333 \text{ lbs PM}_{10}/\text{acre/yr} \times 1.06 \text{ acres} \\ &= 1,413 \text{ lbs PM}_{10}/\text{yr}; \textbf{0.71 tons PM}_{10}/\text{yr}\end{aligned}$$

$$\begin{aligned}\text{Windblown PM}_{2.5} \text{ Emissions} &= 0.71 \text{ tons PM}_{10}/\text{yr} \times 0.132 \text{ PM}_{2.5}/\text{PM}_{10} \\ &= \textbf{0.09 tons PM}_{2.5}/\text{yr}\end{aligned}$$

### *Post-Construction/Paved Emissions*

Post-construction (paved) PM<sub>10</sub> and PM<sub>2.5</sub> emissions are calculated using the CARB Miscellaneous Process Methodology 7.9, *Entrained Road Travel, Paved Road Dust*.

$$\begin{aligned}\text{Vehicle Miles Travelled (VMT)} &= 0.08 \text{ miles/vehicle (40,172 vehicles/yr)} \\ &= 3,214 \text{ VMT/yr}\end{aligned}$$

Emissions calculations are calculated below by following the sample calculation on page 11 of Miscellaneous Process Methodology 7.9.

$$PM_{10} \text{ E.F.} = [k (sL)^{0.91} \times (W)^{1.02}] \times (1-P/4N)$$

Where;

factor	PM 10	
k =	0.0022	EPA AP-42 Table 13.2.1-1
sL =	0.32 (g/m <sup>2</sup> )	Table 7, ARB – Misc. Process Methodology 7.9
W =	2.4 tons	California statewide default
P =	11	Table 7, ARB – Misc. Process Methodology 7.9
N =	365	No. of days in averaging period

$$\begin{aligned}
 PM_{10} \text{ E.F.} &= [0.0022 (0.32)^{0.91} \times (2.4)^{1.02}] \times (1-11/4(365)) \\
 &= (0.0022 \times 0.355 \times 2.44) \times (1 - 11/1460) \\
 &= (0.0019) \times (0.992)
 \end{aligned}$$

$$PM_{10} \text{ E.F.} = 0.00189 \text{ lbs } PM_{10}/VMT$$

$$\begin{aligned}
 \text{Paved Parking Lot } PM_{10} \text{ Emissions} &= 0.00189 \text{ lbs } PM_{10}/VMT \times 2,170 \text{ VMT/yr} \\
 &= 6.07 \text{ lbs } PM_{10}/\text{yr}; \mathbf{0.003 \text{ tons } PM_{10}/\text{yr}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Paved Parking Lot } PM_{2.5} \text{ Emissions} &= \text{tons/yr } PM_{10} \times \text{Fraction } (PM_{2.5}/PM_{10}) \\
 &= 0.003 \text{ tons } PM_{10}/\text{yr} \times (0.0686/0.4572) \\
 &= \mathbf{0.0005 \text{ tons } PM_{2.5}/\text{yr}}
 \end{aligned}$$

### Component 2 Total Emissions Reductions (County Center II Lot)

Unpaved Parking Lot Emissions	PM 10 (tons/yr)	PM2.5 (tons/yr)
Unpaved Parking Lot Emissions	3.21	0.32
Unpaved Windblown Emissions	0.71	0.09
Total Unpaved Emissions	3.92	0.41
Paved Parking Lot Emissions	0.003	0.0005
<b>Total Emission Reductions</b>	<b>3.92</b>	<b>0.41</b>

### Component 3 – Reducing Dust Emissions form Unpaved Alleyways (El Centro, CA)

Component 3 will reduce directly emitted PM10 and PM2.5 emissions from dust generated due to disturbances of the surface of various unpaved alleyways located adjacent to residences within El Centro, CA. The analysis below shows the emissions reduction calculations for paving this network of native soil alleyways, which total approximately 11.25 miles (59,420 linear feet), with asphaltic concrete (AC) roadway surfacing. The stated methodology for these calculations is the same one used in the Imperial County 2018 Annual PM2.5 SIP:

#### Existing Project Emissions

Existing unpaved fugitive PM10 and PM2.5 emissions from alleyways in the City of El Centro are calculated using the CARB Miscellaneous Process Methodology 7.10, *Unpaved Road Dust, Non-Farm Roads*. Additional

information on this methodology is available at: [https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-10\\_2012.pdf](https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-10_2012.pdf). An Emission Factor (EF) of 2 lbs PM<sub>10</sub> and 0.2 lbs PM<sub>2.5</sub> per vehicle miles travelled (VMT) are used, based on the methodology 7.10.

VMT's are derived using 11.25 miles (59,420 linear feet), which includes the sum length of the network of unpaved alleyways proposed for paving by the City of El Centro. The average daily trips (ADT) of 42.78 will be applied to the 11.25 miles of unpaved alleyways, since this is the total average of daily trips for the 107 unpaved alleyway segments in El Centro, CA.

$$\text{Vehicle Miles Travelled} = 11.25 \text{ miles (42.78 ADT)} = 481.275 \text{ VMT/day}$$

$$\begin{aligned} \text{Unpaved PM}_{10} \text{ Emissions} &= 2 \text{ lbs PM}_{10}/\text{VMT} \times 481.275 \text{ VMT/day} \\ &= 962.55 \text{ lbs PM}_{10}/\text{day}; 0.481 \text{ tons PM}_{10}/\text{day} \\ &= 0.481 \text{ tons PM}_{10}/\text{day} \times 365 \text{ days/yr} \\ &= \mathbf{175.67 \text{ tons PM}_{10}/\text{yr}} \end{aligned}$$

$$\begin{aligned} \text{Unpaved PM}_{2.5} \text{ Emissions} &= 0.2 \text{ lbs PM}_{2.5}/\text{VMT} \times 481.275 \text{ VMT/day} \\ &= 96.26 \text{ lbs PM}_{2.5}/\text{day}; 0.048 \text{ tons PM}_{2.5}/\text{day} \\ &= 0.048 \text{ tons PM}_{2.5}/\text{day} \times 365 \text{ days/yr} \\ &= \mathbf{17.57 \text{ tons PM}_{2.5}/\text{yr}} \end{aligned}$$

Existing Windblown PM<sub>10</sub> and PM<sub>2.5</sub> emissions from unpaved alleyways in the City of El Centro are calculated using the CARB Windblown Dust – Unpaved Roads Section 7.13 Methodology. Additional information on this methodology is available at: <https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-13.pdf>. An Emission Factor (EF) of 3,230 lbs PM<sub>10</sub>/mile is used based on the methodology mentioned above. PM<sub>2.5</sub> is calculated as 13.2 percent of PM<sub>10</sub>, which is the ARB particle size profile used in the Updating Imperial County PM<sub>2.5</sub> NAA Windblown Dust Emissions document ([https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014\\_impwbd.pdf](https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014_impwbd.pdf)).

$$\begin{aligned} \text{Windblown PM}_{10} \text{ Emissions} &= 3,230 \text{ lbs PM}_{10}/\text{mile} \times 11.25 \text{ miles} \\ &= 36,337.5 \text{ lbs PM}_{10}/\text{yr}; \mathbf{18.17 \text{ tons PM}_{10}/\text{yr}} \end{aligned}$$

$$\begin{aligned} \text{Windblown PM}_{2.5} \text{ Emissions} &= 18.17 \text{ tons PM}_{10}/\text{yr} \times 0.132 \text{ PM}_{2.5}/\text{PM}_{10} \\ &= \mathbf{2.40 \text{ tons PM}_{2.5}/\text{yr}} \end{aligned}$$

#### *Post-Construction/Paved Emissions*

Post-construction (paved) PM<sub>10</sub> and PM<sub>2.5</sub> emissions are calculated using the CARB Miscellaneous Process Methodology 7.9, *Entrained Road Travel, Paved Road Dust*. Additional information on this methodology is available at: [https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9\\_2018.pdf](https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf).

$$\text{Vehicle Miles Travelled} = 11.25 \text{ miles (42.78 ADT)} = 481.275 \text{ VMT/day}$$

Emissions calculations are calculate below by following the sample calculation on page 11 of Miscellaneous Process Methodology 7.9.

$$\text{PM}_{10} \text{ E.F.} = [ k (sL)^{0.91} \times (W)^{1.02} ] \times (1-P/4N)$$



Where;

factor	PM 10	
k =	0.0022	EPA AP-42 Table 13.2.1-1
sL =	0.32 (g/m <sup>2</sup> )	Table 7, ARB – Misc. Process Methodology 7.9
W =	2.4 tons	California statewide default
P =	11	Table 7, ARB – Misc. Process Methodology 7.9
N =	365	No. of days in averaging period

$$\begin{aligned}\text{PM}_{10} \text{ E.F.} &= [0.0022 (0.32) 0.91 \times (2.4) 1.02] \times (1 - 11/4(365)) \\ &= (0.0022 \times 0.355 \times 2.44) \times (1 - 11/1460) \\ &= (0.0019) \times (0.992)\end{aligned}$$

$$\text{PM}_{10} \text{ E.F.} = 0.00189 \text{ lbs PM}_{10}/\text{VMT}$$

$$\begin{aligned}\text{Paved Road PM}_{10} \text{ Emissions} &= 0.00189 \text{ lbs PM}_{10}/\text{VMT} \times 481.275 \text{ VMT/day} \\ &= 0.910 \text{ lbs PM}_{10}/\text{Day} \\ &= 0.910 \text{ lbs PM}_{10}/\text{Day} \times 365 \text{ days/yr} \\ &= 332.01 \text{ lbs PM}_{10}/\text{yr}; \mathbf{0.166 \text{ tons PM}_{10}/\text{yr}}\end{aligned}$$

$$\begin{aligned}\text{Paved Road PM}_{2.5} \text{ Emissions} &= \text{tons/yr PM}_{10} \times \text{Fraction (PM}_{2.5}/\text{PM}_{10}) \\ &= 0.166 \text{ tons PM}_{10}/\text{yr} \times (0.0686/0.4572) \\ &= \mathbf{0.025 \text{ tons PM}_{2.5}/\text{yr}}\end{aligned}$$

### ***Component 3 Total Emissions Reductions (El Centro Alleyways)***

<b>Unpaved Alleyway Emissions</b>	<b>PM 10 (tons/yr)</b>	<b>PM<sub>2.5</sub> (tons/yr)</b>
Unpaved Alley Emissions	175.67	17.57
Unpaved Windblown Emissions	18.17	2.40
Total Unpaved Emissions	193.84	19.97
<b>Paved Road Emissions</b>	0.166	0.025
<b>Total Emissions Reductions</b>	<b>193.67</b>	<b>19.95</b>

### **Component 4 – Reducing Dust Emissions form Unpaved Alleyways (Calexico, CA)**

Component 4 will reduce directly emitted PM<sub>10</sub> and PM<sub>2.5</sub> emissions from dust generated due to disturbances of the surface of the various unpaved alleyways located in residential and commercial areas within Calexico, CA. The following is an analysis of the emissions reduction calculations for paving this network of unpaved alleyways (Class 2 Base Alleys and the Asphalt Alleys), with the stated methodology for these calculations being the same one used in the Imperial County 2018 Annual PM<sub>2.5</sub> SIP:

#### *Existing Project Emissions (Class 2 Base Alleyways)*

Existing unpaved fugitive PM<sub>10</sub> and PM<sub>2.5</sub> emissions from the 2.84 miles of alleyways that will be improved with Class 2 Base in the City of Calexico are calculated using the CARB Miscellaneous Process Methodology 7.10, *Unpaved Road Dust, Non-Farm Roads*. Additional information on this methodology is available at:

[https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-10\\_2012.pdf](https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-10_2012.pdf). An Emission Factor (EF) of 2 lbs PM<sub>10</sub> and 0.2 lbs PM<sub>2.5</sub> per vehicle miles travelled (VMT) are used, based on the methodology 7.10. VMTs are derived by using 2.84 miles (15,000 linear feet), which be the final length of all the alleyways that are paved in Calexico, and an average daily trip (ADT) rate of 50 vehicles.

$$\begin{aligned}\text{Vehicle Miles Travelled (VMT)} &= 2.84 \text{ miles/vehicle} \times 50 \text{ ADT} \\ &= 142 \text{ VMT/day}\end{aligned}$$

$$\begin{aligned}\text{Unpaved PM}_{10} \text{ Emissions} &= 2.0 \text{ lbs PM}_{10}/\text{VMT} \times 142 \text{ VMT/day} \\ &= 284.0 \text{ lbs PM}_{10}/\text{day}; 0.14 \text{ tons PM}_{10}/\text{day} \\ &= 0.14 \text{ tons PM}_{10}/\text{day} \times 365 \text{ days/yr} \\ &= \mathbf{51.83 \text{ tons PM}_{10}/\text{yr}}\end{aligned}$$

$$\begin{aligned}\text{Unpaved PM}_{2.5} \text{ Emissions} &= 0.2 \text{ lbs PM}_{2.5}/\text{VMT} \times 142 \text{ VMT/day} \\ &= 28.4 \text{ lbs PM}_{2.5}/\text{day}; 0.014 \text{ tons PM}_{2.5}/\text{day} \\ &= 0.014 \text{ tons PM}_{2.5}/\text{day} \times 365 \text{ days/yr} \\ &= \mathbf{5.18 \text{ tons PM}_{2.5}/\text{yr}}\end{aligned}$$

Existing unpaved Windblown PM<sub>10</sub> and PM<sub>2.5</sub> emissions from this set of alleyways in Calexico are calculated using the CARB Windblown Dust – Unpaved Roads Section 7.13 Methodology. Additional information on this methodology is available at: <https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-13.pdf>. An Emission Factor (EF) of 3,230 lbs PM<sub>10</sub>/mile is used based on the methodology mentioned above. PM<sub>2.5</sub> is calculated as 13.2 percent of PM<sub>10</sub>, which is the ARB particle size profile used in the Updating Imperial County PM<sub>2.5</sub> NAA Windblown Dust Emissions document ([https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014\\_impwbd.pdf](https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014_impwbd.pdf)).

$$\begin{aligned}\text{Windblown PM}_{10} \text{ Emissions} &= 3,230 \text{ lbs PM}_{10}/\text{mile} \times 2.84 \text{ miles} \\ &= 9,173.2 \text{ lbs PM}_{10}/\text{yr}; \mathbf{4.59 \text{ tons PM}_{10}/\text{yr}}\end{aligned}$$

$$\begin{aligned}\text{Windblown PM}_{2.5} \text{ Emissions} &= 4.59 \text{ tons PM}_{10}/\text{yr} \times 0.132 \text{ PM}_{2.5}/\text{PM}_{10} \\ &= \mathbf{0.61 \text{ tons PM}_{2.5}/\text{yr}}\end{aligned}$$

#### *Post-Construction/Paved Emissions (Class 2 Base Alleyways)*

Post-construction (paved) PM<sub>10</sub> and PM<sub>2.5</sub> emissions are calculated using the CARB Miscellaneous Process Methodology 7.9, *Entrained Road Travel, Paved Road Dust*. Additional information on this methodology is available at: [https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9\\_2018.pdf](https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf).

$$\begin{aligned}\text{Vehicle Miles Travelled (VMT)} &= 2.84 \text{ miles/vehicle (50 ADT)} \\ &= 142 \text{ VMT/day}\end{aligned}$$

Emissions calculations are calculated below by following the sample calculation on page 11 of Miscellaneous Process Methodology 7.9.

$$\text{PM}_{10} \text{ E.F.} = [k (\text{sL})^{0.91} \times (\text{W})^{1.02}] \times (1 - \text{P}/4\text{N})$$

Where;

factor	PM 10	
k =	0.0022	EPA AP-42 Table 13.2.1-1
sL =	0.32 (g/m <sup>2</sup> )	Table 7, ARB – Misc. Process Methodology 7.9
W =	2.4 tons	California statewide default
P =	11	Table 7, ARB – Misc. Process Methodology 7.9
N =	365	No. of days in averaging period

$$\begin{aligned}
 \text{Paved Parking Lot PM}_{10} \text{ Emissions} &= 0.00189 \text{ lbs PM}_{10}/\text{VMT} \times 142 \text{ VMT/day} \\
 &= 0.27 \text{ lbs PM}_{10}/\text{Day} \\
 &= 0.27 \text{ lbs PM}_{10}/\text{Day} \times 365 \text{ days/yr} \\
 &= 97.96 \text{ lbs PM}_{10}/\text{yr}; \mathbf{0.049 \text{ tons PM}_{10}/\text{yr}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Paved Parking Lot PM}_{2.5} \text{ Emissions} &= \text{tons/yr PM}_{10} \times \text{Fraction (PM}_{2.5}/\text{PM}_{10}) \\
 &= 0.049 \text{ tons PM}_{10}/\text{yr} \times (0.0686/0.4572) \\
 &= \mathbf{0.0007 \text{ tons PM}_{2.5}/\text{yr}}
 \end{aligned}$$

### *Total Emissions Reductions (Class 2 Base Alleyways)*

<b>Unpaved Alleyways Emissions</b>	<b>PM 10 (tons/yr)</b>	<b>PM2.5 (tons/yr)</b>
Unpaved Alley Emissions	51.83	5.18
Unpaved Windblown Emissions	4.59	0.61
Total Unpaved Emissions	56.42	5.79
<b>Paved Alleyways Emissions</b>	0.049	0.007
<b>Total Emission Reductions</b>	<b>56.37</b>	<b>5.79</b>

### *Existing Project Emissions (Asphalt Alleyways)*

Existing unpaved fugitive PM<sub>10</sub> and PM<sub>2.5</sub> emissions from the 0.62 miles of alleyways that will be improved with asphalt in the City of Calexico are calculated using the CARB Miscellaneous Process Methodology 7.10, *Unpaved Road Dust, Non-Farm Roads*. Additional information on this methodology is available at: [https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-10\\_2012.pdf](https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-10_2012.pdf). An Emission Factor (EF) of 2 lbs PM<sub>10</sub> and 0.2 lbs PM<sub>2.5</sub> per vehicle miles travelled (VMT) are used, based on the methodology 7.10. VMTs are derived by using 0.62 miles (3,288 linear feet) for the two extreme-use alleyways in the City of Calexico that will be paved with asphalt and an estimated average daily trip (ADT) rate of 500 vehicles, based on the large volume of vehicle traffic on these road segments by commercial vehicles and the U.S. Border Patrol.

$$\begin{aligned}
 \text{Vehicle Miles Travelled (VMT)} &= 0.62 \text{ miles/vehicle} \times 500 \text{ ADT} \\
 &= 310 \text{ VMT/day}
 \end{aligned}$$

$$\begin{aligned}
 \text{Unpaved PM}_{10} \text{ Emissions} &= 2.0 \text{ lbs PM}_{10}/\text{VMT} \times 1310 \text{ VMT/day} \\
 &= 620.0 \text{ lbs PM}_{10}/\text{day}; 0.31 \text{ tons PM}_{10}/\text{day} \\
 &= 0.31 \text{ tons PM}_{10}/\text{day} \times 365 \text{ days/yr} \\
 &= \mathbf{113.15 \text{ tons PM}_{10}/\text{yr}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Unpaved PM}_{2.5} \text{ Emissions} &= 0.2 \text{ lbs PM}_{2.5}/\text{VMT} \times 310 \text{ VMT/day} \\
 &= 62.0 \text{ lbs PM}_{2.5}/\text{day}; 0.031 \text{ tons PM}_{2.5}/\text{day} \\
 &= 0.031 \text{ tons PM}_{2.5}/\text{day} \times 365 \text{ days/yr} \\
 &= \mathbf{11.32 \text{ tons PM}_{2.5}/\text{yr}}
 \end{aligned}$$

Existing unpaved Windblown PM<sub>10</sub> and PM<sub>2.5</sub> emissions from these two alleyways in Calexico are calculated using the CARB Windblown Dust – Unpaved Roads Section 7.13 Methodology. Additional information on this methodology is available at: <https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-13.pdf>. An Emission Factor (EF) of 3,230 lbs PM<sub>10</sub>/mile is used based on the methodology mentioned above. PM<sub>2.5</sub> is calculated as 13.2 percent of PM<sub>10</sub>, which is the ARB particle size profile used in the Updating Imperial County PM<sub>2.5</sub> NAA Windblown Dust Emissions document ([https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014\\_impwbd.pdf](https://ww3.arb.ca.gov/ei/areasrc/districtmeth/imperial/2014_impwbd.pdf)).

$$\begin{aligned}
 \text{Windblown PM}_{10} \text{ Emissions} &= 3,230 \text{ lbs PM}_{10}/\text{mile} \times 0.62 \text{ miles} \\
 &= 2,002.6 \text{ lbs PM}_{10}/\text{yr}; \mathbf{1.00 \text{ tons PM}_{10}/\text{yr}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Windblown PM}_{2.5} \text{ Emissions} &= 1.00 \text{ tons PM}_{10}/\text{yr} \times 0.132 \text{ PM}_{2.5}/\text{PM}_{10} \\
 &= \mathbf{0.13 \text{ tons PM}_{2.5}/\text{yr}}
 \end{aligned}$$

#### *Post-Construction/Paved Emissions (Asphalt Alleyways)*

Post-construction (paved) PM<sub>10</sub> and PM<sub>2.5</sub> emissions are calculated using the CARB Miscellaneous Process Methodology 7.9, *Entrained Road Travel, Paved Road Dust*. Additional information on this methodology is available at: [https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9\\_2018.pdf](https://ww3.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf).

$$\begin{aligned}
 \text{Vehicle Miles Travelled (VMT)} &= 0.62 \text{ miles/vehicle (500 ADT)} \\
 &= 310 \text{ VMT/day}
 \end{aligned}$$

Emissions calculations are calculated below by following the sample calculation on page 11 of Miscellaneous Process Methodology 7.9.

$$\text{PM}_{10} \text{ E.F.} = [k (sL)^{0.91} \times (W)^{1.02}] \times (1-P/4N)$$

Where;

factor	PM 10	
k =	0.0022	EPA AP-42 Table 13.2.1-1
sL =	0.32 (g/m <sup>2</sup> )	Table 7, ARB – Misc. Process Methodology 7.9
W =	2.4 tons	California statewide default
P =	11	Table 7, ARB – Misc. Process Methodology 7.9
N =	365	No. of days in averaging period

$$\begin{aligned}
 \text{Paved Parking Lot PM}_{10} \text{ Emissions} &= 0.00189 \text{ lbs PM}_{10}/\text{VMT} \times 310 \text{ VMT/day} \\
 &= 0.586 \text{ lbs PM}_{10}/\text{Day} \\
 &= 0.586 \text{ lbs PM}_{10}/\text{Day} \times 365 \text{ days/yr} \\
 &= 213.85 \text{ lbs PM}_{10}/\text{yr}; \mathbf{0.107 \text{ tons PM}_{10}/\text{yr}}
 \end{aligned}$$

$$\begin{aligned}
 \text{Paved Parking Lot PM}_{2.5} \text{ Emissions} &= \text{tons/yr PM}_{10} \times \text{Fraction (PM}_{2.5}/\text{PM}_{10}) \\
 &= 0.107 \text{ tons PM}_{10}/\text{yr} \times (0.0686/0.4572) \\
 &= \mathbf{0.016 \text{ tons PM}_{2.5}/\text{yr}}
 \end{aligned}$$

***Total Emissions Reductions (Asphalt Alleyways)***

<b>Unpaved Alleyways Emissions</b>	<b>PM 10 (tons/yr)</b>	<b>PM2.5 (tons/yr)</b>
Unpaved Alley Emissions	113.15	11.32
Unpaved Windblown Emissions	1.00	0.13
Total Unpaved Emissions	114.15	11.45
<b>Paved Alleyways Emissions</b>	0.107	0.016
<b>Total Emission Reductions</b>	<b>114.04</b>	<b>11.43</b>

***Component 4 Total Emissions Reductions (All Unpaved Calexico Alleyways)***

<b>Category</b>	<b>PM 10 (tons/yr)</b>	<b>PM2.5 (tons/yr)</b>
Class 2 Base Alleyways Reductions	56.37	5.79
Asphalt Alleyways Reductions	114.04	11.43
<b>Total Emission Reductions (All Alleyways)</b>	<b>170.41</b>	<b>17.22</b>

## **ATTACHMENT C. LETTERS OF SUPPORT/PARTNERSHIP**



## **COMPONENT 1 – Reducing Dust Emissions from Unpaved School Lots**



# Magnolia Union Elementary School District

4502 Casey Road  
Brawley, CA 92227

**February 11, 2020**

Imperial County APCD  
150 S. 9<sup>th</sup> St.  
El Centro, CA 92243

**Re: Letter of Support for School District Paving Projects**

Dear Mr. Matt Dessert:

Magnolia Union Elementary School District supports the efforts of the Imperial County Air Pollution Control District to pave the 32,000 sq. ft. dirt parking lot at Magnolia Elementary School, located at 4502 Casey Rd., Brawley, CA. This small, rural school has one primary parking lot that is used by school students' parents and staff as it is a 'pick up and drop off' zone twice per day. The parking lot is also utilized for special school events at least twelve (12) times per year. Paving this unpaved lot would greatly benefit the health of students, families, and faculty of the school with the resulting reductions of particulate matter emissions.

If you have any questions, please contact the Supt/Principal: Blaine R. Smith.

Sincerely,

Blaine R. Smith  
Supt/Principal  
Magnolia Union Elementary  
4502 Casey Road  
Brawley, CA 92227  
760 344 2494



## HOLTVILLE UNIFIED SCHOOL DISTRICT

621 E. Sixth Street, Holtville, Ca. 92250  
(760) 356-2974 (760) 356-4936 fax  
[www.holtville.k12.ca.us](http://www.holtville.k12.ca.us)

**February 10, 2020**

Imperial County APCD  
150 S. 9<sup>th</sup> St.  
El Centro, CA 92243

**Re: Letter of Support for School District Paving Projects**

Dear Mr. Matt Dessert:

Holtville Unified School District (HUSD) supports the efforts of the Imperial County Air Pollution Control District to pave the various dirt parking lots at Holtville High School and Pine School, which are both part of HUSD. School faculty, students' families, and sports teams drive through the unpaved lots on a daily basis. At times, these lots are also utilized for special school and community events. Paving these dirt lots would greatly benefit the health of students, families, and faculty of the school with the resulting reductions of particulate matter emissions.

If you have any questions, please contact the undersigned at Celso Ruiz, [celso@husd.net](mailto:celso@husd.net) or call 760-356-2974.

Sincerely,

Celso Ruiz  
Superintendent

Board of Trustees

---

Kevin Grizzle Ben Abatti, Jr. Matthew Hester Jared Garewal Robin Cartee



## HOLTVILLE UNIFIED SCHOOL DISTRICT

621 E. Sixth Street, Holtville, Ca. 92250  
(760) 356-2974 (760) 356-4936 fax  
[www.holtville.k12.ca.us](http://www.holtville.k12.ca.us)

February 10, 2020

Imperial County APCD  
150 S. 9<sup>th</sup> St.  
El Centro, CA 92243



**Re: Letter of Support for School District Paving Projects**

Dear Mr. Matt Dessert:

Holtville High School supports the efforts of the Imperial County Air Pollution Control District to pave the various dirt parking lots at Holtville High School, which is part of HUSD. School faculty, students' families, and sports teams drive through the unpaved lots on a daily basis. At times, these lots are also utilized for special school and community events. Paving these dirt lots would greatly benefit the health of students, families, and faculty of the school with the resulting reductions of particulate matter emissions.

If you have any questions, please contact the undersigned at Anthony Arevalo, [aarevalo@husd.net](mailto:aarevalo@husd.net) or call 760-356-2926.

Sincerely,

Anthony Arevalo  
High School Principal

Board of Trustees

---

Kevin Grizzle Ben Abatti, Jr. Matthew Hester Jared Garewal Robin Cartee



## HOLTVILLE UNIFIED SCHOOL DISTRICT

621 E. Sixth Street, Holtville, Ca. 92250  
(760) 356-2974 (760) 356-4936 fax  
[www.holtville.k12.ca.us](http://www.holtville.k12.ca.us)

February 10, 2020

Imperial County APCD  
150 S. 9<sup>th</sup> St.  
El Centro, CA 92243



### Re: Letter of Support for School District Paving Projects

Dear Mr. Matt Dessert:

Pine Elementary School supports the efforts of the Imperial County Air Pollution Control District to pave the various dirt parking lots at Pine School, which is part of HUSD. School faculty, students' families, and sports teams drive through the unpaved lots on a daily basis. At times, these lots are also utilized for special school and community events. Paving these dirt lots would greatly benefit the health of students, families, and faculty of the school with the resulting reductions of particulate matter emissions.

If you have any questions, please contact the undersigned at Patricia Harrison,  
[pharrison@husd.net](mailto:pharrison@husd.net) or call 760-356-2615.

Sincerely,

Patricia Harrison  
Pine School Principal

### Board of Trustees

---

Kevin Grizzle Ben Abatti, Jr. Matthew Hester Jared Garewal Robin Cartee

## **COMPONENT 2 – Reducing Dust Emissions from Unpaved County Lot**





COUNTY OF  
IMPERIAL

DEPARTMENT OF  
PUBLIC WORKS

155 S. 11th Street  
El Centro, CA  
92243

Tel: (442) 265-1818  
Fax: (442) 265-1858

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CountyDpw/](https://twitter.com/CountyDpw/)



*Public Works works for the Public*

**March 24, 2020**

U.S. Environmental Protection Agency  
ATTN: Tim Roberts  
1200 Pennsylvania Ave., NW  
Mail Code: 6102A  
Washington, DC 20460

**Re: Letter of Support for County Center II-ICSO Parking Lot Paving Project**

Dear Mr. Roberts,

The Imperial County Public Works Department (ICPWD) strongly supports the Imperial County Air Pollution Control District's (ICAPCD) efforts to secure funding through an application to EPA's Targeted Airshed Grant (TAG) Program in order to pave a significantly used unpaved parking lot at County Center II, located at 328 Applestill Road in El Centro, CA. The Imperial County Sheriff's Office (ICSO), various Imperial County workers, and the public utilize an unpaved parking lot at this location, which is approximately 46,000 sq. ft. in size (1.06 acres).

The ICPWD will collaborate with the ICAPCD to implement this paving project, with ICPWD Staff managing the construction of the project at this Imperial County facility. Improving this dirt parking lot at County Center II with pavement will reduce the amount of PM<sub>2.5</sub> and PM<sub>10</sub> emissions in the City of El Centro, which in turn will benefit the health of workers and residents of the County of Imperial. Additionally, the paving of this lot will aid Imperial County in reducing emissions within the Assembly Bill 617 (AB 617) Community of El Centro, Heber, and Calexico.

In conclusion, ICPWD provides its full support to the ICAPCD to apply and obtain funding through the TAG Program to implement this emissions reduction project. If you have any questions regarding this matter, please contact the undersigned at 442-265-1818.

Sincerely,

John Gay, P.E.

Director of Public Works  
County Road Commissioner

JAG/cv



# IMPERIAL COUNTY SHERIFF'S OFFICE

**RAYMOND LOERA**  
SHERIFF•CORONER•MARSHAL



**March 24, 2020**

U.S. Environmental Protection Agency  
ATTN: Tim Roberts  
1200 Pennsylvania Ave., NW  
Mail Code: 6102A  
Washington, DC 20460

**Re: Letter of Support for County Center II-ICSO Parking Lot Paving Project**

Dear Mr. Roberts,

The Imperial County Sheriff's Office (ICSO) strongly supports the Imperial County Air Pollution Control District's efforts to secure funding through an application to EPA's Targeted Airshed Grant (TAG) Program in order to pave a high-traffic unpaved parking lot at County Center II, located at 328 Applestill Road in El Centro, CA. ICSO Staff and members of the public utilize an unpaved parking lot, which is approximately 46,000 sq. ft. in size, each day at this location for various reasons including attorney visits, inmate visitations, training and facility events, and business filings.

Paving this centrally, located dirt lot at County Center II will reduce the amount of PM<sub>2.5</sub> and PM<sub>10</sub> emissions in the City of El Centro, which in turn will benefit the health of ICSO and Imperial County workers. The health will also be improved for nearby residents and members of the public who visit this facility. Finally, due to the project's location, the paving of this lot will aid Imperial County in reducing emissions within the Assembly Bill 617 (AB 617) Community of El Centro, Heber, and Calexico.

In conclusion, ICSO gives its full support to the ICAPCD to apply and obtain funding through the TAG Program to implement this emissions reduction project. If you have any questions regarding this matter, please contact Undersheriff Fred Miramontes at (442) 265-2002 or [FMiramontes@icso.org](mailto:FMiramontes@icso.org).

Sincerely,

A handwritten signature in blue ink that reads "Raymond Loera".

Raymond Loera  
Sheriff-Coroner-Marshal

## **COMPONENT 3 – Reducing Dust Emissions from Unpaved Alleyways (El Centro, CA)**



March 26, 2020

U.S. Environmental Protection Agency  
ATTN: Tim Roberts  
1200 Pennsylvania Ave., NW  
Mail Code: 6102A  
Washington, DC 20460

**Re: Letter of Support for El Centro Alleyway PM<sub>2.5</sub> Reduction Project**

Dear Mr. Roberts,

The City of El Centro supports the Imperial County Air Pollution Control District's (ICAPCD) efforts of implementing the proposal of paving a network of unpaved alleyways throughout the City by securing funds through the U.S. EPA Targeted Airshed Grant (TAG) Program. The City of El Centro submitted a proposal to the ICAPCD for improving native soil alleyways with asphaltic concrete (AC) roadway surfacing for various alleyways. The total length of native soil alleyways in this proposal is approximately 59,420 linear feet (11.25 miles).

Alleyways throughout the City of El Centro tend to be the primary access routes for residents' homes, secondary dwellings, and/or apartment complex's parking. Paving these heavily used unpaved alleyways would assist the County of Imperial with improving its PM<sub>2.5</sub> Non-Attainment Status and the ICAPCD with reducing air emissions in the Assembly Bill 617 local Community of El Centro-Heber-Calexico. Above all, the implementation of this emissions reduction project will reduce the health risk imposed on our City of El Centro residents.

In summary, the City of El Centro fully supports the ICAPCD's grant application to U.S. EPA for this emissions reduction project. If you have any questions, please feel free to contact me at 760-337-5182 or at [jluna@cityofelcentro.org](mailto:jluna@cityofelcentro.org).

Sincerely,

Javier Luna, P.E.  
Senior Engineer

***Department of Public Works • Engineering Division***

***1275 Main Street, El Centro, CA 92243 (760) 337-5182 Fax (760) 337-3856***

## **COMPONENT 4 – Reducing Dust Emissions from Unpaved Alleyways (Calexico, CA)**



# CITY OF CALEXICO

608 Heber Ave.  
Calexico, CA 92231-2840  
Tel: 760.768.2110  
Fax: 760.768.2103  
[www.calexico.ca.gov](http://www.calexico.ca.gov)

March 23, 2020

U.S. Environmental Protection Agency  
ATTN: Tim Roberts  
1200 Pennsylvania Ave., NW  
Mail Code: 6102A  
Washington, DC 20460

**Re: Letter of Support for Calexico Alleyway Emissions Reduction Project**

Dear Mr. Roberts,

The City of Calexico supports the Imperial County Air Pollution Control District's (ICAPCD) efforts to pave various unpaved (dirt) alleyways throughout the City through the ICAPCD's application to the U.S. EPA Targeted Airshed Grant (TAG) Program. The City of Calexico submitted a proposal to the ICAPCD to improve a network of dirt alleyways in the City, totaling 15,000 linear feet (2.84 miles) with Class 2 Base, and improve several extreme-use alleyways totaling 3,500 linear feet (0.66 miles) with Asphalt.

Residents who access their homes (single and multi-family units), commercial businesses, and law enforcement commonly use these unpaved alleyways in the City of Calexico. Paving these heavily used unpaved alleyways would assist the County of Imperial with reducing PM<sub>2.5</sub> and PM<sub>10</sub> emissions in Imperial County and within the Assembly Bill 617 local Community of El Centro-Heber-Calexico. The air emissions exposure to residents of the City of Calexico will also be reduced with the implementation of this proposed project.

In summary, the City of Calexico fully supports the ICAPCD's grant application to U.S. EPA for this emissions reduction project. If you have any questions or require additional information, please do not hesitate to contact me at 760-768-2110.

Sincerely,

David Dale  
City Manager

*Viva Calexico!*